INSTALLATION AND OPERATION MANUAL

ASMi-54

G.SHDSL.bis Modem

Version 1.0

RAD
data communications
The Access Company

ASMi-54

G.SHDSL.bis Modem

Version 1.0

Installation and Operation Manual

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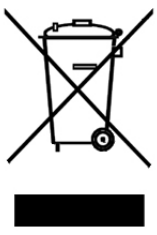
Product Disposal



To facilitate the reuse, recycling and other forms of recovery of waste equipment in protecting the environment, the owner of this RAD product is required to refrain from disposing of this product as unsorted municipal waste at the end of its life cycle. Upon termination of the unit's use, customers should provide for its collection for reuse, recycling or other form of environmentally conscientious disposal.

General Safety Instructions

The following instructions serve as a general guide for the safe installation and operation of telecommunications products. Additional instructions, if applicable, are included inside the manual.

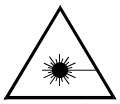
Safety Symbols

Warning

This symbol may appear on the equipment or in the text. It indicates potential safety hazards regarding product operation or maintenance to operator or service personnel.

Danger of electric shock! Avoid any contact with the marked surface while the product is energized or connected to outdoor telecommunication lines.

Protective ground: the marked lug or terminal should be connected to the building protective ground bus.



Warning

Some products may be equipped with a laser diode. In such cases, a label with the laser class and other warnings as applicable will be attached near the optical transmitter. The laser warning symbol may be also attached.

Please observe the following precautions:

- Before turning on the equipment, make sure that the fiber optic cable is intact and is connected to the transmitter.
- Do not attempt to adjust the laser drive current.
- Do not use broken or unterminated fiber-optic cables/connectors or look straight at the laser beam.
- The use of optical devices with the equipment will increase eye hazard.
- Use of controls, adjustments or performing procedures other than those specified herein, may result in hazardous radiation exposure.

ATTENTION: The laser beam may be invisible!

In some cases, the users may insert their own SFP laser transceivers into the product. Users are alerted that RAD cannot be held responsible for any damage that may result if non-compliant transceivers are used. In particular, users are warned to use only agency approved products that comply with the local laser safety regulations for Class 1 laser products.

Always observe standard safety precautions during installation, operation and maintenance of this product. Only qualified and authorized service personnel should carry out adjustment, maintenance or repairs to this product. No installation, adjustment, maintenance or repairs should be performed by either the operator or the user.

Handling Energized Products

General Safety Practices

Do not touch or tamper with the power supply when the power cord is connected. Line voltages may be present inside certain products even when the power switch (if installed) is in the OFF position or a fuse is blown. For DC-powered products, although the voltages levels are usually not hazardous, energy hazards may still exist.

Before working on equipment connected to power lines or telecommunication lines, remove jewelry or any other metallic object that may come into contact with energized parts.

Unless otherwise specified, all products are intended to be grounded during normal use. Grounding is provided by connecting the mains plug to a wall socket with a protective ground terminal. If a ground lug is provided on the product, it should be connected to the protective ground at all times, by a wire with a diameter of 18 AWG or wider. Rack-mounted equipment should be mounted only in grounded racks and cabinets.

Always make the ground connection first and disconnect it last. Do not connect telecommunication cables to ungrounded equipment. Make sure that all other cables are disconnected before disconnecting the ground.

Connecting AC Mains

Make sure that the electrical installation complies with local codes.

Always connect the AC plug to a wall socket with a protective ground.

The maximum permissible current capability of the branch distribution circuit that supplies power to the product is 16A. The circuit breaker in the building installation should have high breaking capacity and must operate at short-circuit current exceeding 35A.

Always connect the power cord first to the equipment and then to the wall socket. If a power switch is provided in the equipment, set it to the OFF position. If the power cord cannot be readily disconnected in case of emergency, make sure that a readily accessible circuit breaker or emergency switch is installed in the building installation.

In cases when the power distribution system is IT type, the switch must disconnect both poles simultaneously.

Connecting DC Power

Unless otherwise specified in the manual, the DC input to the equipment is floating in reference to the ground. Any single pole can be externally grounded.

Due to the high current capability of DC power systems, care should be taken when connecting the DC supply to avoid short-circuits and fire hazards.

DC units should be installed in a restricted access area, i.e. an area where access is authorized only to qualified service and maintenance personnel.

Make sure that the DC power supply is electrically isolated from any AC source and that the installation complies with the local codes.

The maximum permissible current capability of the branch distribution circuit that supplies power to the product is 16A. The circuit breaker in the building installation should have high breaking capacity and must operate at short-circuit current exceeding 35A.

Before connecting the DC supply wires, ensure that power is removed from the DC circuit. Locate the circuit breaker of the panel board that services the equipment and switch it to the OFF position. When connecting the DC supply wires, first connect the ground wire to the corresponding terminal, then the positive pole and last the negative pole. Switch the circuit breaker back to the ON position.

A readily accessible disconnect device that is suitably rated and approved should be incorporated in the building installation.

If the DC power supply is floating, the switch must disconnect both poles simultaneously.

Connecting Data and Telecommunications Cables

Data and telecommunication interfaces are classified according to their safety status.

The following table lists the status of several standard interfaces. If the status of a given port differs from the standard one, a notice will be given in the manual.

Ports	Safety Status	
V.11, V.28, V.35, V.36, RS-530, X.21, 10 BaseT, 100 BaseT, Unbalanced E1, E2, E3, STM, DS-2, DS-3, S-Interface ISDN, Analog voice E&M	SELV	Safety Extra Low Voltage: Ports which do not present a safety hazard. Usually up to 30 VAC or 60 VDC.
xDSL (without feeding voltage), Balanced E1, T1, Sub E1/T1	TNV-1	Telecommunication Network Voltage-1: Ports whose normal operating voltage is within the limits of SELV, on which overvoltages from telecommunications networks are possible.
FXS (Foreign Exchange Subscriber)	TNV-2	Telecommunication Network Voltage-2: Ports whose normal operating voltage exceeds the limits of SELV (usually up to 120 VDC or telephone ringing voltages), on which overvoltages from telecommunication networks are not possible. These ports are not permitted to be directly connected to external telephone and data lines.
FXO (Foreign Exchange Office), xDSL (with feeding voltage), U-Interface ISDN	TNV-3	Telecommunication Network Voltage-3: Ports whose normal operating voltage exceeds the limits of SELV (usually up to 120 VDC or telephone ringing voltages), on which overvoltages from telecommunication networks are possible.

Always connect a given port to a port of the same safety status. If in doubt, seek the assistance of a qualified safety engineer.

Always make sure that the equipment is grounded before connecting telecommunication cables. Do not disconnect the ground connection before disconnecting all telecommunications cables.

Some SELV and non-SELV circuits use the same connectors. Use caution when connecting cables. Extra caution should be exercised during thunderstorms.

When using shielded or coaxial cables, verify that there is a good ground connection at both ends. The grounding and bonding of the ground connections should comply with the local codes.

The telecommunication wiring in the building may be damaged or present a fire hazard in case of contact between exposed external wires and the AC power lines. In order to reduce the risk,

there are restrictions on the diameter of wires in the telecom cables, between the equipment and the mating connectors.

Caution To reduce the risk of fire, use only No. 26 AWG or larger telecommunication line cords.

Attention Pour réduire les risques s'incendie, utiliser seulement des conducteurs de télécommunications 26 AWG ou de section supérieure.

Some ports are suitable for connection to intra-building or non-exposed wiring or cabling only. In such cases, a notice will be given in the installation instructions.

Do not attempt to tamper with any carrier-provided equipment or connection hardware.

Electromagnetic Compatibility (EMC)

The equipment is designed and approved to comply with the electromagnetic regulations of major regulatory bodies. The following instructions may enhance the performance of the equipment and will provide better protection against excessive emission and better immunity against disturbances.

A good ground connection is essential. When installing the equipment in a rack, make sure to remove all traces of paint from the mounting points. Use suitable lock-washers and torque. If an external grounding lug is provided, connect it to the ground bus using braided wire as short as possible.

The equipment is designed to comply with EMC requirements when connecting it with unshielded twisted pair (UTP) cables. However, the use of shielded wires is always recommended, especially for high-rate data. In some cases, when unshielded wires are used, ferrite cores should be installed on certain cables. In such cases, special instructions are provided in the manual.

Disconnect all wires which are not in permanent use, such as cables used for one-time configuration.

The compliance of the equipment with the regulations for conducted emission on the data lines is dependent on the cable quality. The emission is tested for UTP with 80 dB longitudinal conversion loss (LCL).

Unless otherwise specified or described in the manual, TNV-1 and TNV-3 ports provide secondary protection against surges on the data lines. Primary protectors should be provided in the building installation.

The equipment is designed to provide adequate protection against electro-static discharge (ESD). However, it is good working practice to use caution when connecting cables terminated with plastic connectors (without a grounded metal hood, such as flat cables) to sensitive data lines. Before connecting such cables, discharge yourself by touching ground or wear an ESD preventive wrist strap.

FCC-15 User Information

This equipment has been tested and found to comply with the limits of the Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the Installation and Operation manual, may cause harmful interference to the radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Canadian Emission Requirements

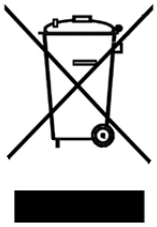
This Class A digital apparatus meets all the requirements of the Canadian Interference-Causing Equipment Regulation.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Warning per EN 55022 (CISPR-22)

Warning	This is a class A product. In a domestic environment, this product may cause radio interference, in which case the user will be required to take adequate measures.
Avertissement	Cet appareil est un appareil de Classe A. Dans un environnement résidentiel, cet appareil peut provoquer des brouillages radioélectriques. Dans ces cas, il peut être demandé à l'utilisateur de prendre les mesures appropriées.
Achtung	Das vorliegende Gerät fällt unter die Funkstörgrenzwertklasse A. In Wohngebieten können beim Betrieb dieses Gerätes Rundfunkströrungen auftreten, für deren Behebung der Benutzer verantwortlich ist.

Mise au rebut du produit



Afin de faciliter la réutilisation, le recyclage ainsi que d'autres formes de récupération d'équipement mis au rebut dans le cadre de la protection de l'environnement, il est demandé au propriétaire de ce produit RAD de ne pas mettre ce dernier au rebut en tant que déchet municipal non trié, une fois que le produit est arrivé en fin de cycle de vie. Le client devrait proposer des solutions de réutilisation, de recyclage ou toute autre forme de mise au rebut de cette unité dans un esprit de protection de l'environnement, lorsqu'il aura fini de l'utiliser.

Instructions générales de sécurité

Les instructions suivantes servent de guide général d'installation et d'opération sécurisées des produits de télécommunications. Des instructions supplémentaires sont éventuellement indiquées dans le manuel.

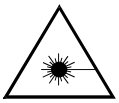
Symboles de sécurité

Avertissement

Ce symbole peut apparaitre sur l'équipement ou dans le texte. Il indique des risques potentiels de sécurité pour l'opérateur ou le personnel de service, quant à l'opération du produit ou à sa maintenance.

Danger de choc électrique ! Evitez tout contact avec la surface marquée tant que le produit est sous tension ou connecté à des lignes externes de télécommunications.

Mise à la terre de protection : la cosse ou la borne marquée devrait être connectée à la prise de terre de protection du bâtiment.



Avertissement

Certains produits peuvent être équipés d'une diode laser. Dans de tels cas, une étiquette indiquant la classe laser ainsi que d'autres avertissements, le cas échéant, sera jointe près du transmetteur optique. Le symbole d'avertissement laser peut aussi être joint.

Veuillez observer les précautions suivantes :

- Avant la mise en marche de l'équipement, assurez-vous que le câble de fibre optique est intact et qu'il est connecté au transmetteur.
- Ne tentez pas d'ajuster le courant de la commande laser.
- N'utilisez pas des câbles ou connecteurs de fibre optique cassés ou sans terminaison et n'observez pas directement un rayon laser.
- L'usage de périphériques optiques avec l'équipement augmentera le risque pour les yeux.
- L'usage de contrôles, ajustages ou procédures autres que celles spécifiées ici pourrait résulter en une dangereuse exposition aux radiations.

ATTENTION : Le rayon laser peut être invisible !

Les utilisateurs pourront, dans certains cas, insérer leurs propres émetteurs-récepteurs Laser SFP dans le produit. Les utilisateurs sont avertis que RAD ne pourra pas être tenue responsable de tout dommage pouvant résulter de l'utilisation d'émetteurs-récepteurs non conformes. Plus particulièrement, les utilisateurs sont avertis de n'utiliser que des produits approuvés par l'agence et conformes à la réglementation locale de sécurité laser pour les produits laser de classe 1.

Respectez toujours les précautions standards de sécurité durant l'installation, l'opération et la maintenance de ce produit. Seul le personnel de service qualifié et autorisé devrait effectuer l'ajustage, la maintenance ou les réparations de ce produit. Aucune opération d'installation, d'ajustage, de maintenance ou de réparation ne devrait être effectuée par l'opérateur ou l'utilisateur.

Manipuler des produits sous tension

Règles générales de sécurité

Ne pas toucher ou altérer l'alimentation en courant lorsque le câble d'alimentation est branché. Des tensions de lignes peuvent être présentes dans certains produits, même lorsque le commutateur (s'il est installé) est en position OFF ou si le fusible est rompu. Pour les produits alimentés par CC, les niveaux de tension ne sont généralement pas dangereux mais des risques de courant peuvent toujours exister.

Avant de travailler sur un équipement connecté aux lignes de tension ou de télécommunications, retirez vos bijoux ou tout autre objet métallique pouvant venir en contact avec les pièces sous tension.

Sauf s'il en est autrement indiqué, tous les produits sont destinés à être mis à la terre durant l'usage normal. La mise à la terre est fournie par la connexion de la fiche principale à une prise murale équipée d'une borne protectrice de mise à la terre. Si une cosse de mise à la terre est fournie avec le produit, elle devrait être connectée à tout moment à une mise à la terre de protection par un conducteur de diamètre 18 AWG ou plus. L'équipement monté en châssis ne devrait être monté que sur des châssis et dans des armoires mises à la terre.

Branchez toujours la mise à la terre en premier et débranchez-la en dernier. Ne branchez pas des câbles de télécommunications à un équipement qui n'est pas mis à la terre. Assurez-vous que tous les autres câbles sont débranchés avant de déconnecter la mise à la terre.

Connexion au courant du secteur

Assurez-vous que l'installation électrique est conforme à la réglementation locale.

Branchez toujours la fiche de secteur à une prise murale équipée d'une borne protectrice de mise à la terre.

La capacité maximale permissible en courant du circuit de distribution de la connexion alimentant le produit est de 16A. Le coupe-circuit dans l'installation du bâtiment devrait avoir une capacité élevée de rupture et devrait fonctionner sur courant de court-circuit dépassant 35A.

Branchez toujours le câble d'alimentation en premier à l'équipement puis à la prise murale. Si un commutateur est fourni avec l'équipement, fixez-le en position OFF. Si le câble d'alimentation ne peut pas être facilement débranché en cas d'urgence, assurez-vous qu'un coupe-circuit ou un disjoncteur d'urgence facilement accessible est installé dans l'installation du bâtiment.

Le disjoncteur devrait déconnecter simultanément les deux pôles si le système de distribution de courant est de type IT.

Connexion d'alimentation CC

Sauf s'il en est autrement spécifié dans le manuel, l'entrée CC de l'équipement est flottante par rapport à la mise à la terre. Tout pôle doit être mis à la terre en externe.

A cause de la capacité de courant des systèmes à alimentation CC, des précautions devraient être prises lors de la connexion de l'alimentation CC pour éviter des courts-circuits et des risques d'incendie.

Les unités CC devraient être installées dans une zone à accès restreint, une zone où l'accès n'est autorisé qu'au personnel qualifié de service et de maintenance.

Assurez-vous que l'alimentation CC est isolée de toute source de courant CA (secteur) et que l'installation est conforme à la réglementation locale.

La capacité maximale permissible en courant du circuit de distribution de la connexion alimentant le produit est de 16A. Le coupe-circuit dans l'installation du bâtiment devrait avoir une capacité élevée de rupture et devrait fonctionner sur courant de court-circuit dépassant 35A.

Avant la connexion des câbles d'alimentation en courant CC, assurez-vous que le circuit CC n'est pas sous tension. Localisez le coupe-circuit dans le tableau desservant l'équipement et fixez-le en position OFF. Lors de la connexion de câbles d'alimentation CC, connectez d'abord le conducteur de mise à la terre à la borne correspondante, puis le pôle positif et en dernier, le pôle négatif. Remettez le coupe-circuit en position ON.

Un disjoncteur facilement accessible, adapté et approuvé devrait être intégré à l'installation du bâtiment.

Le disjoncteur devrait déconnecter simultanément les deux pôles si l'alimentation en courant CC est flottante.

Quick Start Guide

The ASMi-54 should be installed by an experienced technician only. If you are familiar with the ASMi-54, use this guide to prepare the unit for operation.

1. Installing ASMi-54

Connecting the Interfaces

➤ To connect the interfaces:

1. Connect the user LAN to the RJ-45 connector designated 10/100BaseT (up to four connectors).
2. Connect the control terminal to the front panel CONTROL connector.

   or

   Connect a Telnet host, a PC running a Web browsing application (ConfiguRAD), or an SNMP management station to the Ethernet port.

Connecting the Power

➤ To connect the power:

- Connect the power cable to the power socket on the ASMi-54 rear panel and the other end to the power outlet.

  The unit has no power switch. Operation starts when the power is applied to the power connector.

2. Configuring ASMi-54

Configure ASMi-54 to the desired operation mode via an ASCII terminal connected to the rear panel CONTROL port. After configuring, you can manage the unit over Telnet, a PC running a Web browsing application (ConfiguRAD) or SNMP via the Ethernet port or inband.

Note *Remote management requires the configuration of an IP address (see* Chapter 4*).*

Starting a Terminal Session

➤ **To start a terminal session:**

1. Turn on the control terminal PC and set its default port parameters to 9,600 bps, 8 bits/character, 1 stop bit, no parity.
2. Set the terminal emulator to ANSI VT100 emulation (for optimal view of system menus).
3. Set the terminal screen to show 132 characters.
4. Enter your user name and password and proceed with the management session.

Note *The default user name is* **su***, and the default password is* ***1234****.*

Configuring ASMi-54 SHDSL Ports

When working with two devices back to back, one device should be configured as CO (Central Office) and the other device as CPE (Customer Premise Equipment). The factory default setting is CPE, so only one device needs to be changed.

➤ **To configure ASMi-54 SHDSL ports:**

- Set one device to **CO** (internal clock) and leave the other as **CPE** (receive clock).

Configuring ASMi-54 for Management

➤ **To configure ASMi-54 for management:**

1. From the Host menu, select Main›Configuration›System›Management›**Host**, and configure the following parameters:
   - Host IP address
   - Host IP mask
   - Default gateway.
2. From the Encapsulation menu, select Main›Configuration›System›Management›Host›**Encapsulation**, and configure Host tagging (untagged/tagged). Note that selecting the tagged option displays the following additional parameters that need to be defined:
   - Host VLAN ID
   - Host VLAN Priority

➤ **To configure the manager IP addresses:**

- From the Manager List menu, select Main›Configuration›System›Management›**Managers List**, and enter the manager IP address(es).

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Chapter 1
Introduction

1.1 Overview

ASMi-54 is a standalone SHDSL modem with G.SHDSL.bis and EFM (Ethernet in the First Mile) technologies that provides up to 22.8 Mbps of bandwidth.

ASMi-54 is a dedicated managed SHDSL modem that supports multiple data rates and operates in full duplex mode over 2-wire, 4-wire, or 8-wire lines.

ASMi-54 uses TC-PAM 16 or TC-PAM 32 line coding SHDSL technology to transmit up to 5.7 Mbps of bandwidth, point-to-point, over each copper pair with EFM bonding. This enables each link to synchronize at a different rate and extends the range of digital interfaces. This device offers longer distances and variable data rates up to 5.7 Mbps over 2-wire, 11.4 Mbps over 4-wire, and 22.8 Mbps over 8-wire.

EFM bonding ensures that a failure or addition of a link does not drop the traffic being transmitted over the other wires in the group, nor is the capacity of the group decreased when a new link is added at lower rate. This is particularly relevant for operators offering Ethernet services in the First Mile where fiber is absent or impractical to install.

The ASMi-54 G.SHDSL.bis modem implements the IEEE's 802.1Q standards to provide VLAN-tagging with four levels of prioritization, enabling carriers to offer differentiated Ethernet services. VLAN tagging can also be employed to separate traffic, ensuring transparency of the customer traffic and bolstering security of management traffic.

ASMi-54 provides monitoring, control, and diagnostics of a local unit via a supervisory port (Control).

Versions

Line Interface

ASMi-54 supports SHDSL twisted pair wire-line connection and can be ordered with one of the following pairs of wires:

- One pair (2-wire)
- Two pairs (4-wire)
- Four pairs (8-wire)

Unit Enclosure

ASMi-54 is available in a plastic or metal enclosure.

Applications

Figure 1-1 shows a typical application that includes point-to-point Ethernet services.

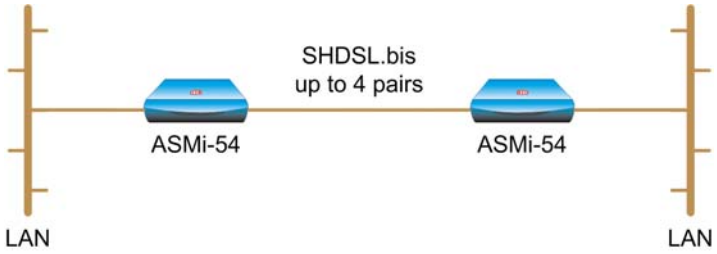

Figure 1-1. ASMi-54 (ETH) vs. ASMi-54 (ETH)

Main Features

Ethernet Interfaces

ASMi-54 provides one or four half/full duplex, 10/100 Mbps Fast Ethernet ports, with flow control and autonegotiation support. All ports are used for user traffic.

SHDSL Network Interfaces

ASMi-54 supports the following features per SHDSL line:

- Enhanced SHDSL ITU-T G.991.2 recommendation for user data rates n × 64 kbps (n = 1..89) up to 5696 kpbs
- Uses TC-PAM 16 or TC-PAM 32 to support higher data rates for G.991.2 Annexes F and G
- SHDSL twisted pair wire-line connection with one pair (2-wires), two pairs (4-wires), or four pairs (8-wires) of wires
- Can be configured to operate as a CO (Central Office) product or as a remote CPE (Customer Premise Equipment) product
- The line rate can be configured to adapt to the line condition (noise, loop attenuation, and so on) or set to a fixed rate
- Range* (26 AWG, noise-free)
  - 192 kpbs – 8 km
  - 1536 kpbs – 5.7 km
  - 2048 kpbs – 5.1 km
  - 4096 kpbs – 3.9 km
  - 4608 kpbs – 3.5 km
  - 5696 kpbs – 2.9 km.

  *Preliminary estimate
- Embedded Operations Channel (EOC) according to G.991.2 recommendation.

WAN Protocol

ASMi-54 supports EFM.

PCS and PME

ASMi-54 follows EFM naming conventions:

- DSL pairs are called PME (Physical Medium Entity)
- A group of pairs (up to four in ASMi-54) is called PCS (Physical Coding Sublayer).

The total bandwidth of the PCS port (the WAN direction) equals the sum of the bandwidths of its underlying PME lines. The maximum rate of a single PME is 5696000, and the maximum bandwidth of the PCS port is 22784000 bps (4×5696000).

Bridging

ASMi-54 provides a bridging function between the various bridge ports:

- Fast Ethernet ports
- Internal host.

The internal bridge operates in VLAN-Unaware or VLAN-Aware modes.

The VLAN-Aware bridge mode allows the user to create a subgroup of bridge ports within the bridge. Each subgroup is associated with a unique VLAN Identifier (VID). Frames can be forwarded only between bridge ports that are members of the same VLAN, enabling a total separation between different VLAN users within the same bridge.

In VLAN-Unaware bridge mode, the bridge ignores VLAN tags and forwards frames only according to their source and destination MAC addresses.

ASMi-54 supports QoS mapping from bridge ports and Ethernet VLAN priority, VLAN stacking/stripping per bridge port, ingress and egress.

Quality of Service

ASMi-54 supports Quality of Service (QoS) on DSL egress direction. Classification is according to VLAN priority (802.1p), DSCP (bits 0-5 in IP TOS byte) and port based. Mapping classification results into four transmit priority queues with strict priority.

Fault Propagation

When the Network › User Fault Propagation feature is enabled, the LAN ports are deactivated when the PCS uplink goes down. They will come up again once the PCS port is resynchronized.

Management

ASMi-54 can be managed via:

- RS-232 craft port
- An inband management channel via Ethernet or PCS port (with or without dedicated VLAN encapsulation).

Access to the ASMi-54 software can be limited to the ASCII terminal and ConfiguRAD management by disabling the Telnet access.

The following functions are supported by the internal management software:

- Local terminal, Telnet server, SNMP (V1), WEB server (ConfiguRAD)

  ConfiguRAD is RAD's Web-based element management system for remote device configuration and maintenance. ConfiguRAD is embedded in the unit and can be accessed from any standard Web browser.

- RADview-Lite

  RADview-Lite is RAD's SNMP-based element management software, providing SNMP traps, status polling, and configuration download. Remote element management is available in either through the ConfiguRAD or Telnet.

- Inband and out-of-band management with/without dedicated management VLAN
- Ping and Trace Routes
- Remote software and configuration download / upload via TFTP
- DHCP client to obtain IP address, mask and default gateway
- Viewing system information
- Modifying configuration and mode of operation, including setting system default values and resetting the unit
- Monitoring performance
- Initiating connectivity tests
- Upgrading software.

Timing

ASMi-54 operates with the following clock sources:

- Internal clock source, derived from the modem as a CO unit
- Received clock source, derived from the DSL line on a CPE unit.

Diagnostics

Real-time alarms provide information on the system status, indicating management failure, synchronization loss, and other conditions.

ASMi-54 also supports performance monitoring.

Event Log File

The Event Log file includes entries at the system and Ethernet levels.

Statistics

ASMi-54 provides statistics and counter capabilities in the physical Ethernet and SHDSL level.

1.2 Physical Description

ASMi-54 is a 1U high standalone device in a plastic or metal enclosure. *Figure 1-2* shows a three-dimensional view of the ASMi-54 unit with Ethernet and SHDSL interfaces. The front and rear panels are shown in *Chapter 3.*

Figure 1-2. ASMi-54 Front View (Plastic Enclosure)

The LEDs are located on the front panel. The interfaces and connectors are located on the rear panel. For more information, see *Chapter 2*.

ASMi-54 can be powered by wide-range AC/DC (100-240 VAC, -48/60 VDC nominal).

1.3 Functional Description

This section describes the major functional features of ASMi-54.

Interfaces

Ethernet Interface

The Ethernet physical interface is 10/100BaseT. The interface supports autonegotiation.

WAN Interface

The SHDSL interface supports ITU-T G.991.2, ETSI 101524, and IEEE EFM (IEEE802.3ah) standards for SHDSL.

Control Interface

The Control port connects directly to an ASCII terminal for managing the ASMi-54.

Ethernet Access (Bridge)

ASMi-54 has a multi-port bridging capability handling up to six bridge ports. The Bridge supports two modes of operation:

- VLAN-Aware
- VLAN-Unaware.

The mechanism of each mode can be described as five different processes:

- **Ingress**: Checks each frame entering the bridge to decide if and how this frame should be passed on to the forwarding process
- **Learning**: Learns new MAC table entries (MAC only or MAC VID pairs)
- **Aging**: Checks the forwarding MAC table periodically
- **Forwarding**: Decides to which bridge port/ports to forward the frame
- **Transmission** (VLAN-Aware mode only): Selects the format of the transmitted frame at the output port: with VLAN ID (tagged) or without VLAN ID (untagged).

Bridge features and these five processes are described below for each mode.

VLAN-Aware Mode

This mode enables the creation of sub-groups of bridge ports within the bridge. Each sub-group is defined per VLAN and is associated with a unique VLAN ID (VID). Frames containing a VID can be forwarded only between bridge ports that are members of this specific VLAN, enabling a total separation between different VLAN users within the same bridge.

Bridge Features

- Full VLAN-Aware bridge in accordance with 802.1Q
- Learning and forwarding according to MAC address and VID
- Learning of up to 1,024 MAC table entries (MAC + VID pairs)
- Configuration of the aging time
- MAC table viewing (learned MACs).

Ingress Process

The ingress process is composed of three steps:

- **Frame Admission:** Two modes of operation (configured per bridge):
  - Admit All Frames: All frames arriving from the port are admitted and proceed to the ingress filtering process. PVID is assigned to untagged or priority only tagged frames.
  - Admit Only VLAN Tagged Frames: Only VLAN tagged frames are admitted and allowed to proceed to the ingress filtering process. Untagged or priority-only tagged frames are discarded.
- **Ingress Filtering:** Works in one of the following modes (configured per bridge port):

- Enable: Performs ingress filtering according to VIDs. Only frames that share a VID assigned to this bridge port are admitted
- Disable: All frames are forwarded.

  Only admitted frames that pass filtering are submitted to learning and forwarding processes.

- **PVID Assignment:** Is per bridge port configuration:

  In VLAN-Aware mode, each received frame entering the bridge is associated with a single VID. In case the received frame does not contain a VLAN ID (untagged or priority only tagged frames), a specific PVID is assigned to these frames before they pass to the forwarding process.

  Accordingly, the untagged/priority tagged frames that have passed the admission/ingress filtering, are tagged with PVID and proceed to the forwarding process. Tagged frames will be double tagged with the PVID only if Tag Stacking is enabled.

  For untagged frames that were tagged during this process to VID=PVID, the priority tag is assigned at the VLAN priority field, according to the default priority configuration.

  Table 1-1 summarizes the behavior of the ingress process:

Table 1-1. Ingress Process

Frame Admission Mode	Ingress Filtering Mode	Bridge Behavior
Admit all frames	Enable	VLAN tagged frames with a VID (or PVID for untagged/priority tagged frames) that do not include the bridge port in their VLAN member set, are dropped.
	Disable	All frames pass.
Admit VLAN tagged frames	Enable	VLAN tagged frames with a VID that do not include the bridge port in their member set are dropped. Untagged/priority-only tagged frames are dropped.
	Disable	All VLAN tagged frames pass. Untagged/priority-only tagged frames are dropped.

Frames that pass this stage are submitted to the forwarding and learning processes.

Learning Process

The learning process observes the source MAC address (SA) and the VID of the received frame, and updates the forwarding database with the MAC VID pair and with the bridge port that the frame was received from. The Forwarding Data Base (FDB) is also referred to as a MAC table.

Entries in the MAC table can be dynamic (inserted by the learning process) or static (inserted by configuration). A dynamic entry has an aging time associated with it.

The ASMi-54 VLAN-Aware bridge is an Independent VLAN Learning (IVL) bridge.

The learning process inserts a new dynamic entry into the MAC table. This entry consists of a MAC-VID pair and bridge port.

- If the MAC-VID pair already exists for the same port, the aging time is updated
- If the MAC-VID pair already exists but for a different bridge port (dynamic entry), the new entry overrides the existing one
- If the MAC-VID pair already exists for a different bridge port (static entry), the static entry prevails.

Aging Process

The aging process checks the forwarding MAC table periodically. Each dynamic entry-aging period that has exceeded the configured Aging Time Limit is deleted. The aging period represents the time passed since the last frame for this entry entered the bridge. The periodic check of the MAC table (aging time intervals) results in the actual aging time that can reach up to twice the value that was configured by the user.

Forwarding Process

The forwarding process is performed based on the frame destination MAC VID pair. The frame is forwarded to the bridge port that was specified in the MAC table for this MAC VID pair entry.

Untagged frames are forwarded according to the PVID that was attached to that frame during the ingress process.

Frames are forwarded, dropped, or flooded according to the following guidelines:

- Forwarded: If the bridge port of the pair entry (DA, VID) in the MAC table is both an active bridge port and a member of the VLAN, the frame is forwarded to that bridge port only.
- Dropped:
  - If the bridge port for the pair entry (DA, VID) in the MAC table is the port on which the frame was received, the frame is dropped.
  - If there are no active ports associated with the frame's VID, or if the VID is not defined at all, the frame is dropped.
- Flooded:
  - If the pair (DA, VID) is not learned and does not exist in the MAC table, the frame is transmitted to all bridge ports that are associated with the frame's VLAN ID.
  - Multicasts and broadcasts are flooded only through the bridge ports whose VLAN ID is identical to the frame's VLAN ID.

Transmission Process

After the forwarding process identifies the destination bridge port/ports to which the frames must be transmitted, the frames are transmitted in the appropriate format.

The frame format can be configured for each VLAN and port:

- VLAN-tagged: In this mode:
  - VLAN-tagged frames are transmitted unchanged.
  - Untagged frames are transmitted tagged with priority according to the default priority of the ingress bridge port, and VID=PVID of the port from which they entered.
  - Priority-tagged frames are transmitted tagged with original priority and VID = PVID.
- Untagged: In this mode, all frames are transmitted as untagged.

VLAN-Unaware Mode

In this mode the bridge forwarding ignores the VLAN ID of VLAN-tagged frames.

Each Ethernet packet received from each bridge port is forwarded according to its destination MAC address.

Bridge Features

Bridge features include:

- Learning and forwarding according to MAC address only
- Learning of up to 2048 MAC addresses
- Configuration of the aging time
- VLAN tagged frames transparency (forwarding according to MAC only)
- MAC table viewing (learned MACs)

Ingress Process

All frames are accepted in this mode: untagged, priority-tagged, or VLAN tagged.

Learning and forwarding is based on the MAC addresses, with no regard to the VLAN. This mode is also known as transparent mode.

Learning Process

The learning process observes the source MAC address (SA) of the received frame and updates the forwarding database (FDB) with the MAC address and the bridge port that the frame was received from. (FDB is also referred to as MAC table).

The learning process inserts a new entry into the MAC table. This entry consists of the MAC and bridge port.

- If the MAC already exists for the same bridge port, the aging time will be updated.
- If the MAC already exists, but for a different bridge port, (dynamic entry) the new entry will override the existing one.

Aging Process

The aging process checks the forwarding MAC table periodically. Each dynamic entry aging time period that has exceeded the configured Aging Time Limit is deleted. The aging time period is the period of time since the last frame for this

entry entered the bridge. The periodic check of the MAC table (aging time intervals), results in an actual aging time that can reach up to twice the value that was configured by the user.

Forwarding Process

The forwarding process is performed based on the frame MAC Destination Address (MDA). The frame is forwarded to the bridge/port specified in the MAC table for this MAC.

Frames are forwarded, dropped, or flooded at this stage:

- Forwarded: A frame will be forwarded according to its DA, to the bridge port where its DA was learned.
- Dropped: If the port for that DA entry in the MAC table is the port on which the frame was received, the frame will be dropped.
- Flooded:
  - If there is no information regarding the DA in the MAC table, the frame is flooded to all ports
  - Frames with multicast or broadcast addresses are flooded to all ports.

Transmission Process

In this bridge mode (VLAN-Unaware), the frames are transmitted unchanged, that is no tags are added or removed.

VLAN Stacking

VLAN Stacking mode for a bridge port refers to the addition of a tag to an incoming frame either at ingress or egress (regardless of whether it already has an existing VLAN tag), and removal of a tag at ingress or egress when the frame leaves from this port.

This setting is independent of the bridge activity.

VLAN Stripping

VLAN Stripping mode for a bridge port refers to the removal of a tag at ingress or egress when the frame leaves from this port.

This setting is independent of the bridge activity.

Quality of Service

ASMi-54 supports QoS mapping to priority queues (4 PQ, strict priority, per bridge port) at the DSL egress direction, according to one of the following:

- VLAN priority (802.1p)
- DSCP (bits 0-5 in IP TOS byte)
- Port based

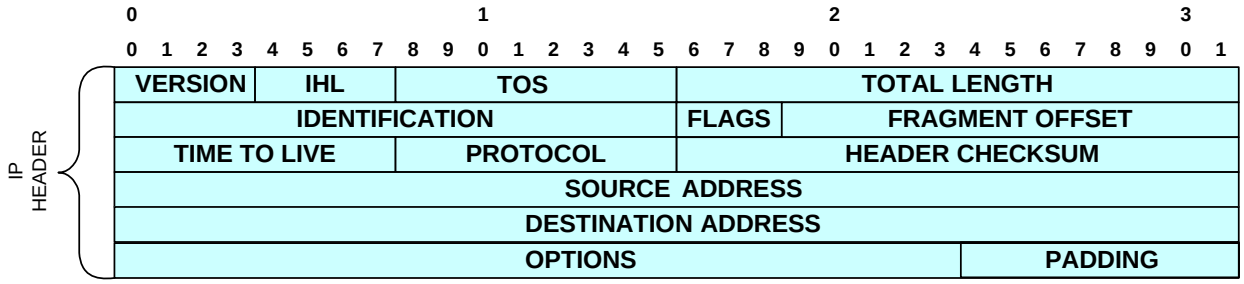

Figure 1-3. IP Header

Bit 0	Bit 1	Bit 2	Bit 3	Bit 4	Bit 5	Bit 6	Bit 7
DS5	DS4	DS3	DS2	DS1	DS0	XX	XX

DSCP: six bits (DS5–DS0)

Figure 1-4. ToS Byte DSCP Field

Management

ASMi-54 performance can be monitored locally from an ASCII terminal, or from a remote site using Telnet or the ConfiguRAD Web-based application. RADview-Lite is also supported.

Inband Management

ASMi-54 supports inband management via Telnet, SNMP, and Web (ConfiguRAD). Configuration, monitoring, and statistics are available.

Out-of-band Management

ASMi-54 enables full configuration and diagnostics via an ASCII terminal. The ASCII terminal is connected to the control port on the rear panel.

For a description of ASCII terminal activation, including general instructions for navigating through the system menus and windows, and modifying data, see *Chapter 3*.

Management Access

The unit's architecture allows access from every bridge port to both the host and remote site devices. In certain configuration modes, a total separation of management traffic from user traffic can be achieved.

VLAN-Based Management Scheme

In this scenario, traffic coming from the remote CPE uses two VLANs: one for user traffic, for which the CPE may use tag stacking, and the other for management traffic. All CPEs connected to the ASMi-54 share the same management VLAN.

In VLAN-Aware mode, ASMi-54 forwards the management traffic to the management station in the Ethernet network. Because a different VLAN is used, total separation between user traffic and management traffic is maintained.

Security

ASCII terminal, Telnet, and Web access are password protected. After a period of 15 minutes of inactivity, the system exits to the password screen.

ASMi-54 supports the following access authorization levels:

- Super-user mode for configuration and monitoring
- User mode for monitoring and configuration view only.

Statistics

ASMi-54 provides statistics and counters at the Ethernet and SHDSL levels.

Event Log File

Events are stored and time stamped in an event log file. Up to 1,000 cyclic entries are maintained. The log file is maintained at the Ethernet, SHDSL, and system levels. For more information, see *Chapter 6*.

Diagnostics and Troubleshooting

ASMi-54 provides several types of diagnostic and troubleshooting procedures:

- Monitoring the system performance
- Displaying status and statistics
- Displaying system messages
- Displaying Events/Traps

  Traps can be masked per manager IP address, upon user configuration.
- Troubleshooting the device
- Performing connectivity tests
  - Running a ping test
  - Tracing the route

For more information on diagnostics and troubleshooting, see *Chapter 6*.

1.4 Technical Specifications

Line Interface	*Type*	2/4/8-wires unconditioned dedicated line (twisted pair)
	Line Coding	TC-PAM 16 or TC-PAM 32
	Line Rate	192 kbps–5696 kbps with steps of n × 64 kbps per 2-wires
	*Range**	• 192 kpbs – 8 km

	(26 AWG, noise free)	• 1536 kpbs – 5.7 km • 2048 kpbs – 5.1 km • 4096 kpbs – 3.9 km • 4608 kpbs – 3.5 km • 5696 kpbs – 2.9 km. *Preliminary estimate
	Impedance	135Ω
	Connector	One RJ-45 per 2 or 4 wires, Two RJ-45 for 8 wires RJ-45: Pair A: pins 4,5, Pair B: pins 3,6
	Standard	ITU-T G.991.2 , ETSI 101524
	Protection	ITU-T K.21
Internal Bridge	*Ports*	Fast Ethernet (up to 4)
	LAN Table	Up to 1,024 MAC addresses (learned)
	Operation Mode	VLAN-Aware, VLAN-Unaware
	Filtering and forwarding	Transparent or filter
Control Port	*Interface*	V.24/RS-232
	Type	DCE
	Format	7 or 8 bits; odd, even or no parity
	Baud Rate	9.6, 19.2, 115.2 kbps
	Connector	9-pin, D-type female
Monitoring	*Statistics*	System and physical layer Alarms ETH and SHDSL frame counters Ethernet physical layer statistics and frame counters
Ethernet Ports	*Interface*	10/100BaseT
	Connectors	One RJ-45 or Four RJ-45
SHDSL Ports	*Connectors*	One RJ-45, Two RJ-45, or Four RJ-45
Monitoring	*Statistics*	System and physical layer Alarms ETH or SHDSL frame counters

Timing		Derived from alternative sources: • Internal oscillator (only CO unit) • Receive, derived from the SHDSL received signal (only CPE unit)
Diagnostics	*Statistics and Performance Monitoring*	SHDSL performance
Indicators (Front Panel)	*PWR (green)*	On: ASMi-54 is powered on Off: ASMi-54 is off
	TST (yellow)	On: A test is active Off: A test is inactive
	SHDSL SYNC (green/red)	Green: at least one PME is synchronized and can pass data Green blinking: no PME is synchronized and at least one PME is in training process Red blinking: no PME is synchronized or in training process, and at least one PME is in PAF establishment stage Red: no PME is synchronized, in training process, or in PAF establishment stage
	ALM (red)	On: A new alarm is detected in the alarm buffer Off: No alarm currently detected
Indicators (Rear Panel)	***Ethernet Ports (one or four)***	
	LINK/ACT (green/yellow)	On (green): Ethernet port link is up Off: No Ethernet link on the port Blink (yellow): Ethernet traffic on the port
Power Source	*AC/DC Voltage*	Wide-range power supply: 100-240 VAC, -48/60 VDC nominal
	Power Consumption	4 × Ethernet Port 2-wires: 5.2 W 4-wires: 5.5 W 8-wires: 7W

Physical	***Plastic Enclosure***	
	Height	43.7 mm (1.7 in)
	Width	217 mm (8.5 in)
	Depth	170 mm (6.7 in)
	Weight	0.5 kg (1.1 lb)
	Metal Enclosure	
	Height	43.7 mm (1.7 in)
	Width	217 mm (8.5 in)
	Depth	170 mm (6.7 in)
	Weight	0.7 kg (1.5 lb)
Environment	*Temperature*	0° to 50°C (32° to 122°F)
	Humidity	Up to 90%, non-condensing

Chapter 2

Installation and Setup

This chapter includes the following topics:

- Site requirements and prerequisites
- Package contents
- Equipment needed
- Installation and setup.

2.1 Introduction

An ASMi-54 unit is delivered completely assembled, and is factory set for basic operation. It is designed for installation as a desktop unit or for mounting in a 19-inch rack. For rack installation instructions, refer to the *Rack Mounting Kit for 19-inch Racks* guide that comes with the RM kit.

After installing the unit, use an ASCII terminal connected to the CONTROL port to perform any configuration necessary. The configuration procedures are described in *Chapter 3* and *Chapter 4*.

If problems are encountered, refer to *Chapter 6*.

Warning

No internal settings, adjustment, maintenance and repairs should be performed by either the operator or the user. Such activities must be performed only by skilled personnel who are aware of the hazards involved.

Always observe standard safety precautions during installation, operation, and maintenance of this product.

2.2 Site Requirements and Prerequisites

AC-powered ASMi-54 units should be installed within 1.5m (5 feet) of an easily accessible grounded AC outlet capable of furnishing the required supply voltage, in the range of 100 to 240 VAC, 50 or 60 Hz.

DC-powered ASMi-54 units require a -48 VDC power source, which must be adequately isolated from the main supply.

Allow at least 90 cm (36 in) of frontal clearance for operator access. For continuous product operation allow at least 10 cm of frontal clearance and at least 15 cm at rear of the unit, for cable connections and ventilation. For proper ventilation, keep at least 2.5 cm clearance from the sides and top of the product.

The ambient operating temperature is 0º–50ºC (32º–122ºF), at a relative humidity of up to 90%, non-condensing.

2.3 Package Contents

The package contains the following items:

- One ASMi-54 unit
- AC power cord or DC adaptor connector
- RM-35-2 kit for mounting in a 19″ rack (if ordered)
- Technical documentation CD.

2.4 Equipment Needed

Hand Tools and Kits

ASMi-54 needs no special tools for installation. You need a screwdriver to mount the unit in a 19-inch rack.

Power Cable

ASMi-54 comes equipped with an appropriate (country or region dependent) power cord to be connected from the power socket on the rear panel to the mains.

Cable and Connectors

Refer to the following table to determine what cables and connectors are required for installation. For all connector pinouts, refer to *Appendix A*.

Table 2-1. Required Connection Media

Interface	Cable/Connector
Control port	Straight RS-232/V.24 cable with DB-9 female connector for ASCII terminal
Fast Ethernet interface	RJ-45, 8-pin connection media
SHDSL Interface	RJ-45, 8-pin connection media

2.5 Mounting the Unit

For mounting the ASMi-54 unit in a 19-inch rack, refer to the *Rack Mounting Kit for 19-inch Racks* guide that comes with the RM-33-2 kit.

2.6 Connecting the Cables

Figure 2-1 - Figure 2-3 show the options for the rear panel of an AC/DC powered ASMi-54 unit.

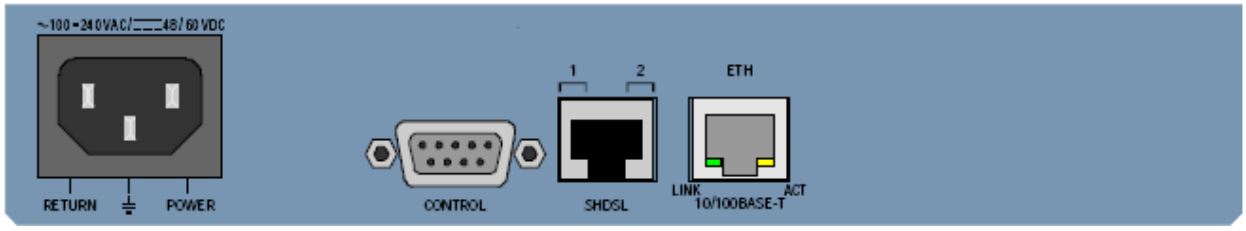

Figure 2-1. ASMi-54 with One or Two SHDSL Ports and One Ethernet Port (Plastic Enclosure)

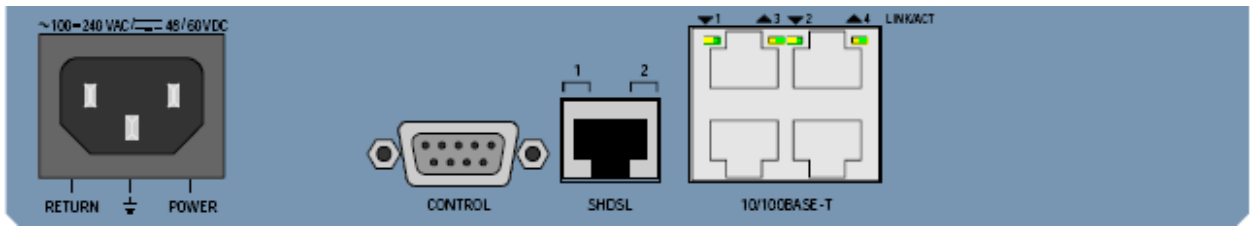

Figure 2-2. ASMi-54 with One or Two SHDSL Ports and Four Ethernet Ports (Plastic Enclosure)

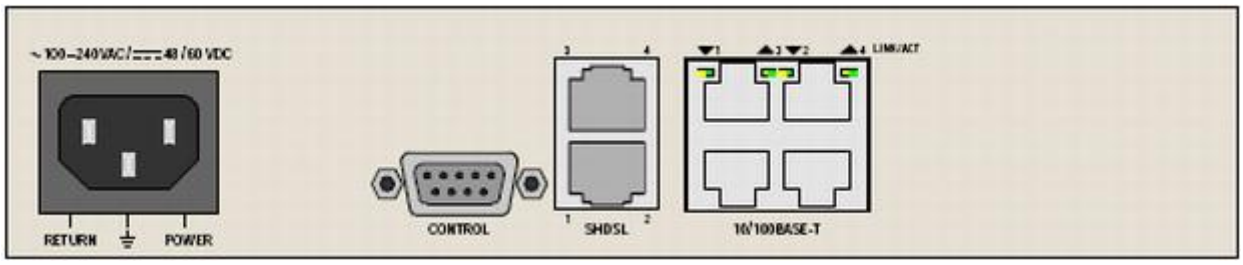

Figure 2-3. ASMi-54 with Four SHDSL Ports and Four Ethernet Ports (Metal Enclosure)

Connecting to the Ethernet Equipment

The ASMi-54 Fast Ethernet interface terminates in an 8-pin RJ-45 connector.

➤ **To connect the Fast Ethernet interface (1 or 4):**

- Connect the LAN to an RJ-45 connector designated 10/100BaseT.

Connecting to the SHDSL Equipment

The SHDSL interfaces terminate in an 8-pin RJ-45 connector.

➤ To connect the SHDSL interface:

- Connect an SHDSL line to an RJ-45 connector designated SHDSL (1,2,3,4).

Connecting to an ASCII Terminal

➤ To connect the ASCII terminal:

- Connect the unit's CONTROL port to an ASCII terminal or an out-of-band management station with a straight RS-232 cable.

2.7 Connecting to Power

ASMi-54 is equipped with a dual input AC/DC power supply. AC or DC power is supplied to ASMi-54 via a standard 3-prong power input connector on the rear panel (see *Figure 2-1*).

Warning

Before connecting this unit to a power source and connecting or disconnecting any other cable, the protective earth terminals of this unit must be connected to the protective ground conductor of the mains (AC or DC) power cord. If you are using an extension cord (power cable) make sure it is grounded as well.

Any interruption of the protective (grounding) conductor (inside or outside the instrument) or disconnecting of the protective earth terminal can make this unit dangerous. Intentional interruption is prohibited.

Connecting AC Power

AC power should be supplied through the 1.5m (5 ft) standard power cable terminated by a standard 3-prong plug. The cable is provided with the unit.

➤ To connect AC power:

1. Connect the power cable to the power connector on the ASMi-54 rear panel.
2. Connect the power cable to the mains outlet.

   The unit turns on automatically upon connection to the mains.

Connecting DC Power

DC power is supplied to ASMi-54 via a compatible AC/DC plug for attaching DC power supply lines.

➤ To connect DC power:

- Refer to the DC power supply connection supplement. Refer to the *Handling Energized Products* section at the front of this manual for safety instructions.

Chapter 3

Operation

This chapter provides the following information for ASMi-54:

- Explains power-on and power-off procedures
- Provides a detailed description of the controls and indicators and their functions
- Provides instructions for using a terminal connected to the ASMi-54 control port
- Describes how to navigate menus
- Describes the configuration alternatives.

For a detailed explanation of parameters on the menus, see *Chapter 4*.

The installation procedures given in *Chapter 2* must be completed and checked before attempting to operate the ASMi-54.

3.1 Turning On the Unit

➤ **To turn on the ASMi-54 unit:**

- Connect the power cord to the mains.

  The PWR indicator lights up and remains lit as long as ASMi-54 receives power.

ASMi-54 requires no operator attention once installed, with the exception of occasional monitoring of front panel indicators. Intervention is only required when the unit must be configured to its operational requirements, or when diagnostic tests are performed.

3.2 Indicators

The ASMi-54 LEDs are located on the front panels.

Front Panel Indicators

Figure 3-1 and *Figure 3-2* show the typical front panel. *Table 3-1* describes the functionality of the ASMi-54 front panel LEDs.

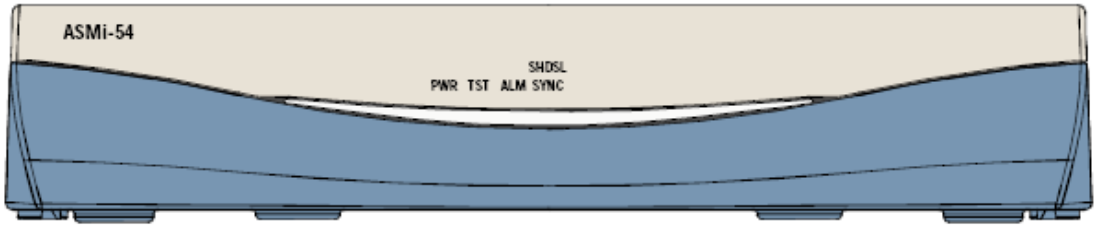

Figure 3-1. ASMi-54 Front Panel (Plastic Enclosure)

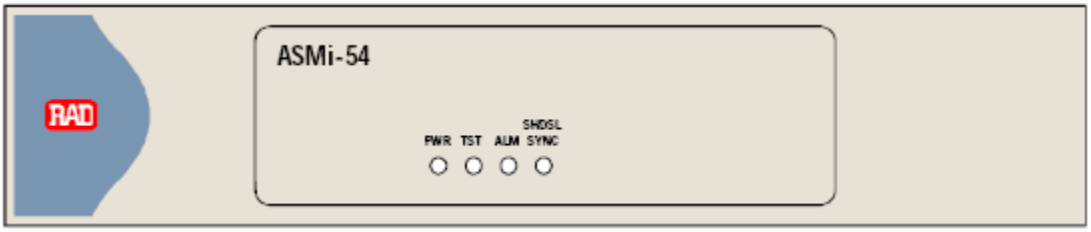

Figure 3-2. ASMi-54 Front Panel (Metal Enclosure)

Table 3-1. ASMi-54 Front Panel LEDs

Name	Color	Function
PWR	Green	On: ASMi-54 is powered on Off: ASMi-54 is off
TST	Red	On: A test is active Off: A test is inactive
ALM	Red	On: Alarm is active Off: No alarm
SHDSL SYNC	Green/Red	Green: at least one PME is synchronized and can pass data Green blinking: no PME is synchronized and at least one PME is in training process Red blinking: no PME is synchronized or in training process, and at least one PME is in PAF establishment stage Red: no PME is synchronized, in training process, or in PAF establishment stage

Rear Panel Indicators

Figure 3-3 - *Figure 3-5* show the options for the rear panel of an AC/DC powered ASMi-54 unit. *Table 3-2* lists the functions of the LED indicators on the rear panel.

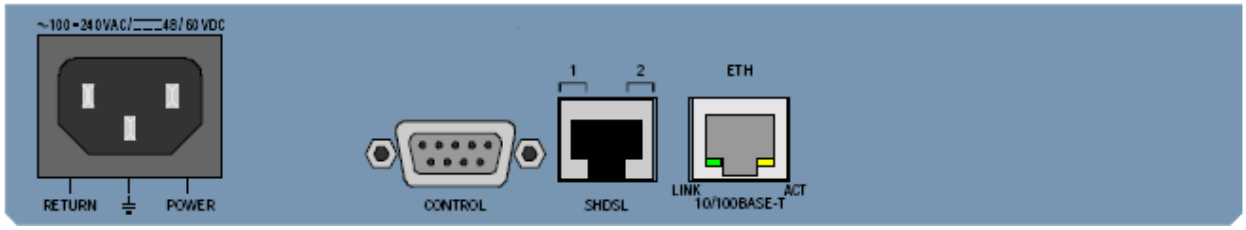

Figure 3-3. ASMi-54 with One SHDSL Port and One Ethernet Port

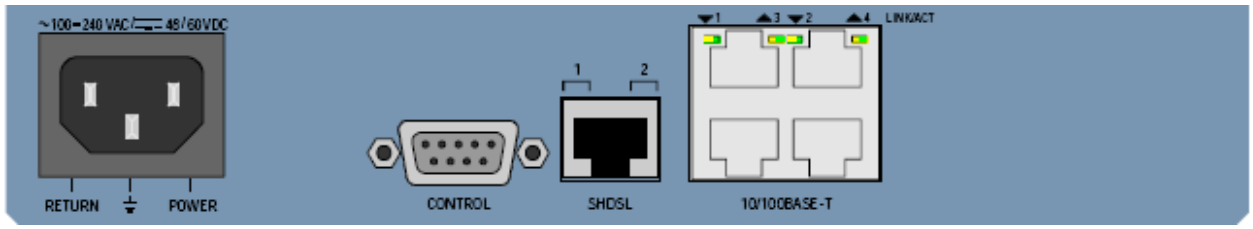

Figure 3-4. ASMi-54 with One SHDSL Port and Four Ethernet Ports

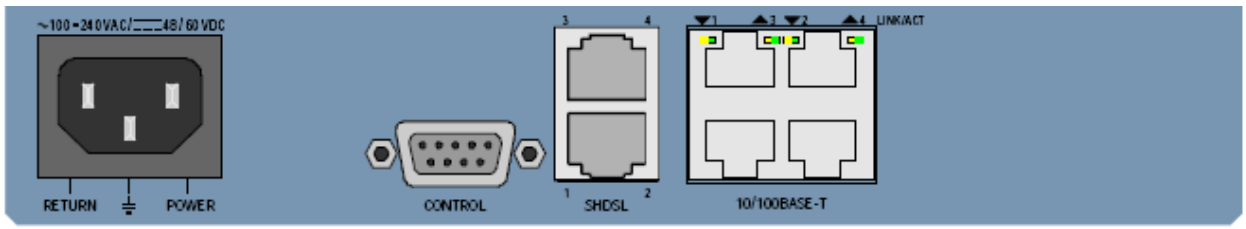

Figure 3-5. ASMi-54 with Two SHDSL Ports and Four Ethernet Ports

Table 3-2. ASMi-54 Rear Panel LEDs

Port	Name	Color	Function
Ethernet Ports (one or four)	ACT for each Ethernet port	Yellow	Blinks according to Ethernet traffic.
	LINK for each Ethernet port	Green	On: Ethernet link is up Off: Ethernet link is down

3.3 Default Settings

Table 3-3 - *Table 3-8* lists the default settings of the ASMi-54 configuration parameters.

Table 3-3. Default System Settings

Menu	Parameter	Default Value
Device Information	Description	ASMi-54, HW Version 0.00, SW Version 1.00
	Name	ASMi-54
	Location	Location of the device
	Contact	Name of the contact person
Host	IP Address	0.0.0.0
	IP Mask	255.255.255.0
	Default Gateway	0.0.0.0
	Read Community	Public
	Write Community	Private
	Trap Community	Public
Encapsulation	Host Tagging	Untagged
	Host VLAN ID	-
	Host Priority Tag	0
Management Access User Access User Level	User Name	USER ; SU
	Old Password	1234
	New Password	Empty string
	Confirm New Password	Empty string
	Telnet Access	Enable
	SNMP Access	Enable
	Web Access	Enable
Terminal	Baud Rate	115 kbps
Fault Propagation	Network › User Fault Propagation	Disable

Table 3-4. Default Ethernet Settings

Menu	Parameter	Default Value
Ethernet	Port	1-4
	Administrative Status	Up
	Auto Negotiation	Enable
	Flow Control	Disable
	Max Capability Advertised	100BaseTX full-duplex
	MDIX Cross Over	Enable

Table 3-5. Default SHDSL Settings

Menu	Parameter	Default Value
SHDSL	PCS (Physical Coding Sublayer)	1
	Administrative Status	Up
	Power Backoff	Disable
	Clock Source	RX Clock: STU-R
PME Configuration	PME (Physical Medium Entity)	1-4
	Administrative Status	Up
	Line Probe	Disable
	Current Margin	0 dB [Disable]
	Worst Margin	0 dB [Disable]
	Loop Attenuation Threshold (dB) [0-127]	0
	SNR Margin Threshold(dB) [0-15]	0

Table 3-6. Default Bridge Settings

Menu	Parameter	Default Value
Bridge	VLAN Mode	Unaware
	Forwarding Mode	Filter
	Aging Time	300

Table 3-7. Default Bridge Port Settings

Menu	Parameter	Default Value
Bridge Port	Bridge Port [1-6]	2
	Ethernet Port [1-4]	1
	Activation	Enable
	Port VID / Stacking VID [1-4094]	2
	Accept Frame Type	All
	Copy Original Priority	Disable
	Default Priority Tag [0-7]	0
	Egress Tag Handling	None
	Ingress Tag Handling	None
Bind	Fast Ethernet [Number] / PCS [Number]	1

Table 3-8. Default QoS Settings

Menu	Parameter	Default Value
QoS	Priority Classification	802.1p
Priority Mapping	User Priority 0	Traffic Class 0
	User Priority 1	Traffic Class 0
	User Priority 2	Traffic Class 0
	User Priority 3	Traffic Class 0
	User Priority 4	Traffic Class 0
	User Priority 5	Traffic Class 0
	User Priority 6	Traffic Class 0
	User Priority 7	Traffic Class 0

3.4 Configuration and Management Alternatives

Configuration and monitoring operations are performed locally from an ASCII terminal connected to the control port or from a Web browser, via ConfiguRAD or RADview-Lite, or via SNMP.

Working with the Terminal

ASMi-54 includes a V.24/RS-232 asynchronous DCE port designated CONTROL, which is terminated in a 9-pin D-type female connector. The control port continuously monitors the incoming data stream and immediately responds to any input string received through this port.

The control port can be configured to communicate at the following rates: 9.6, 19.2, or 115.2 kbps.

➤ **To start a terminal control session:**

1. Make sure all cables and connectors are properly connected.
2. Connect the unit to a PC equipped with an ASCII terminal emulation application (for example, Windows Hyper Terminal or Procomm).
3. Turn on the control terminal PC and set its default port parameters to 9,600 baud, eight bits/character, one stop bit, no parity.
4. Set the terminal emulator to ANSI emulation (for optimal view of system menus).
5. Set the terminal emulator to view a 132-character screen width.
6. When the initialization and self-test are over, a menu appears displaying initialization and self-test results.

Logging In

➤ To log in:

1. Enter **su** for user name with read/write permission.
2. Enter **1234** for (default) password.

Note *It is recommended to change default passwords to prevent unauthorized access to the unit.*

Choosing Options

➤ To choose an option:

1. Press the number corresponding to the option, and press ‹**Enter**›.
2. Press ‹**S**› to save your changes.

   ASMi-54 updates its database with a new value or displays a new menu for the selected option.
3. If you press ‹**ESC**› to exit the menu without saving your changes, the following message appears:

   "Do you want to save changes (Y/N/C)?"

   Press the appropriate letter to save or not save your changes (**Y**es/**N**o/**C**ancel).

Note *When a menu option has only two values, typing the option number and pressing ‹**Enter**› will toggle between the available values.*

Screen Example

The following figure shows a typical screen with main items displayed.

```
                  Product title line (ASMi-54)
                         Short message
1. Sub Menu>
2. Sub Menu>
3. Parameter X [Range] …… (value)
4. Parameter Y>           (Select value from the list)
5. Table Z []

prompt>
Main>Configuration>System>

Help line message
Help line of keyboard shortcuts, such as "Esc-prev" for
returning to the previous menu
-----------Division screen line -----------------
Scroll messages
```

Figure 3-6. Sample Screen

Navigating Tables

Some of the management screens, such as the Manager table, are tables that are larger than regular menus and may require scrolling to navigate between parameters. These screens are best viewed when your terminal screen is set to 132 character width.

Use the following keys (case-sensitive) for table navigation:

Table 3-9. Table Navigation Keys

Key	Navigation
<Ctrl>+L	Move left
Left Arrow	Move left
Ctrl>+R	Move right
Right Arrow	Move right
Up Arrow	Move up
Down Arrow	Move down
<Tab>	Select the next changeable cell
G<row number>, <col number>	Go to the specified cell

Note *You can display these navigation keys by typing **<?>** from a table.*

The following figure shows a Static MAC table in VLAN-Aware mode. For VLAN-unaware bridges, the "VLAN ID" column is not displayed. VLAN ID, MAC address, and Receive Bridge port are the columns of the parameters to be defined.

The "A – Add ; R – Remove ; C – Clear" line appears when at least one entry is configured. If the table is empty, only "A - Add" is displayed.

```
                              ASMi-54
Main Menu>Configuration>Applications>Bridge>Static MAC table

      VLAN ID       MAC address            Receive Bridge port

  1     1          11-11-11-11-11-11             1
| 2     1          22-22-22-22-22-22             2
v 3     2          33-33-33-33-33-33             3
  4     3          44-44-44-44-44-44             3
  5     4          55-55-55-55-55-55             5

1. MAC address … (11-11-11-11-11-11)

A – Add ; R – Remove ; C – Clear
ESC-Previous menu; !-Main menu; &-Exit; ?-Help
```

Figure 3-7. Sample Table Screen (Static MAC Table)

Help Screen Example

The following figure shows a typical Help screen, which summarizes the keyboard shortcuts that are available in the functional screen from which the Help screen was invoked.

The Help screen is invoked by pressing **SHIFT-/** (the **'?'** symbol) from the relevant functional screen. However, not all functional screens have Help available.

```
                          Table Hot Keys

'L'  - move left
'd'  - scroll down       'D' - move down
'a'  - add row           't' - remove row
'm'  - represent entry as menu
'c'  - clear table
TAB  - select next changeable cell

S <row number>,<col number> - select cell
```

Figure 3-8. Typical Help Screen

Working with ConfiguRAD

ConfiguRAD is a Web-based remote access terminal management software. It provides a user-friendly interface for configuring, collecting statistics and performing diagnostic tests on the unit.

Web Browser Requirements

The following Web browsers can be used to access the ASMi-54 ConfiguRAD supervision utility from any location using Internet protocols.

- Internet Explorer version 6.0 and up, running on Windows™ 98, Windows™ 2000, Windows™ XP
- Netscape Communicator version 7.1 and up, running on Windows™ NT or Unix
- Firefox version 1.0.4 and up
- Mozilla version 1.4.3 and up.

Logging In

➤ **To log in via Web browser:**

1. Connect the Ethernet port to the LAN.
2. Open the Web browser.
3. Disable any pop-up blocking software, such as Google Popup Blocker.
4. Enter the IP address of the ASMi-54 in the address field of the browser in the following format: **http://'IP address'** (**'IP address'** stands for the actual ASMi-54 IP address which has to be assigned via an ASCII terminal).
5. Press ‹**Enter**› to command the browser to connect.

6. After the opening window is displayed, click **LOGIN**.
7. In the Password Entry window, enter your user name (read/write user default is **su**) and password (default is **1234**).

   The ConfiguRAD Main menu is displayed.

Note

- *It is recommended to change default passwords to prevent unauthorized access to the unit.*
- *ASMi-54 allows six management sessions to be active simultaneously: one network session (Telnet, ConfiguRAD, RADview-Lite) and one ASCII terminal session.*
- *If no user input is detected for 5 minutes during a ConfiguRAD session, ASMi-54 automatically disconnects from the management station.*

Navigating the ConfiguRAD Menus

At the left-hand bottom corner, ConfiguRAD provides auxiliary management tools:

- **Status** – shows the number of users currently managing the unit.
- **Trace** – opens an additional pane for system messages, progress indicators (ping, software and configuration file downloads) and alarms.
- **Refresh All** – refreshes the data currently displayed.

➤ **To choose an option:**

1. Click a link in the ConfiguRAD screen to display the next menu.
2. Once the target screen is displayed, select a value from the drop-down box or enter it in a text box.

Menu Map

Use the menu maps on the following pages as a reference aid when performing configuration and control functions (see *Figure 3-9* -

Figure 3-11).

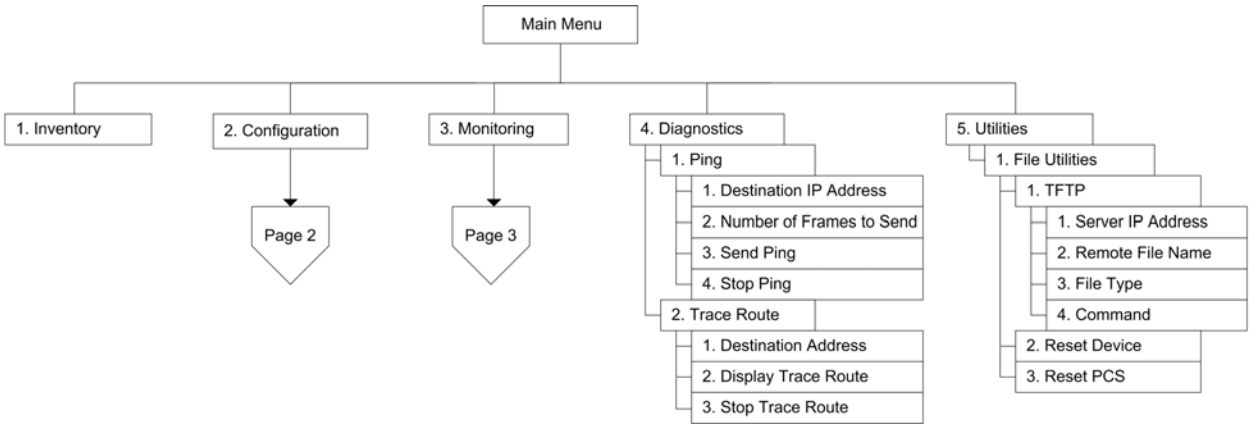

Figure 3-9. Main Menu Map

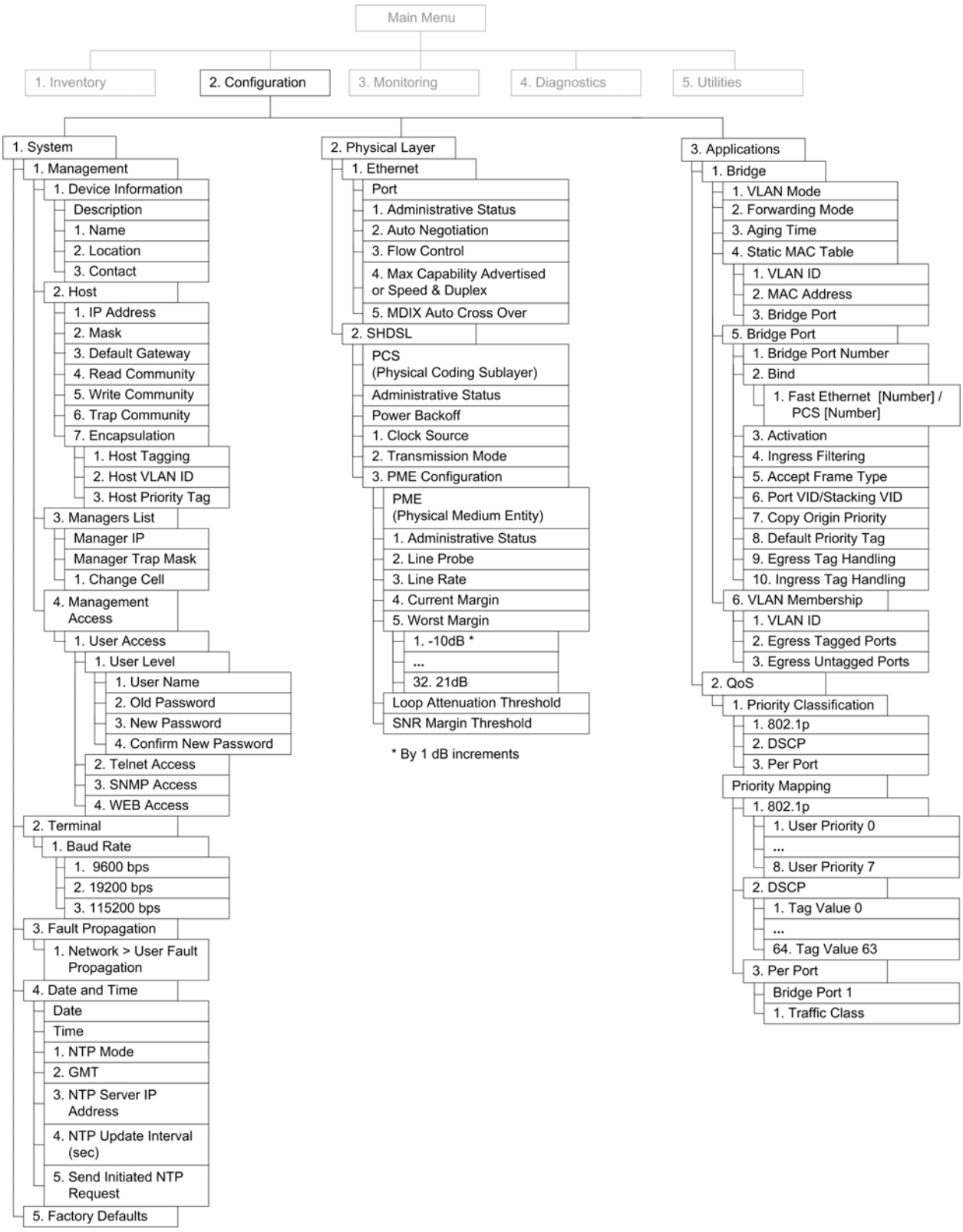

Figure 3-10. Configuration Menu Map – Page 2

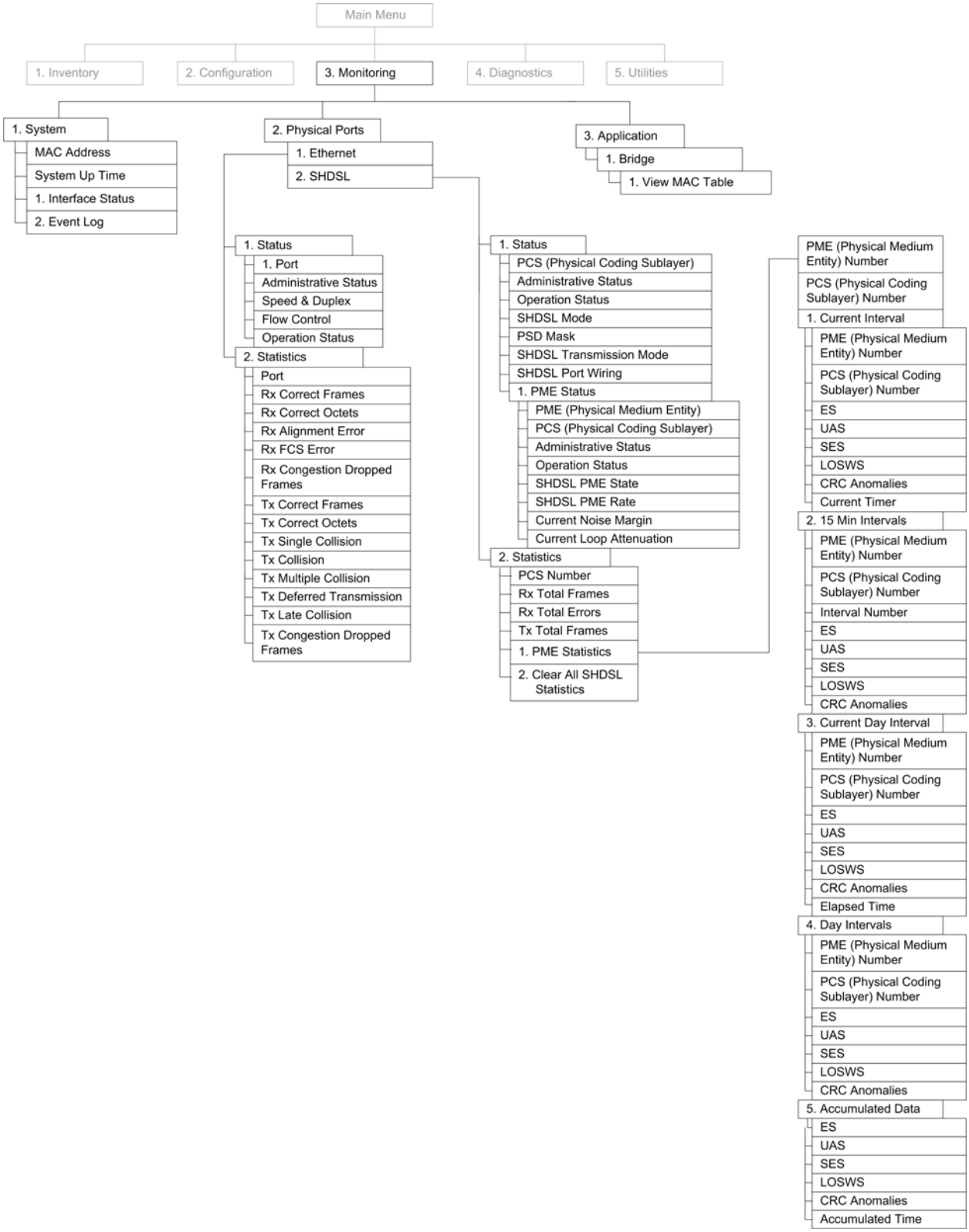

Figure 3-11. Monitoring Menu Map – Page 3

3.5 Turning Off the Unit

➤ **To power off the ASMi-54 unit:**

- Remove the power cord from the power source.

Chapter 4

Configuration

This chapter describes how to configure the ASMi-54 for management and operational tasks. Configuration screens are shown, and configuration parameters explained.

Note *The configuration screens illustrated in this chapter are taken from a terminal screen, but most of the menus are similar to those viewed in Telnet and ConfiguRAD.*

This chapter includes the following sections:

- Configuring for Management
- Configuring for Operation
- Additional Tasks.

For a complete list of all menu items, see menu in *Chapter 3*.

For instructions on accessing and navigating the screens, see *Chapter 3*.

4.1 Configuring for Management

This section describes how to configure the ASMi-54 for management functions.

Entering Device Information

The ASMi-54 management software allows you to assign a name for the unit, and specify its location to distinguish it from the other devices installed in your system. A contact person can also be assigned. Each of these fields can hold up to 50 characters.

➤ **To enter device information:**

1. Select Main Menu›**Configuration**.

   The Configuration screen appears (see *Figure 4-1*).

2. Select **System**.

   The Configuration System screen appears (see *Figure 4-2*).

3. Select **Management**.

   The Management screen appears (see *Figure 4-3*).

4. Select **Device Info**.

   The Device Information screen appears (see *Figure 4-4* for a typical screen example). The description of the unit is factory set.

5. Select **Device Name,** and type a name for the unit.

   The default name is ASMi-54.

6. Select **Location**, and type a location name/description.
7. Select **Contact Person**, and type the name of a contact person for this unit.
8. Press <**S**> to save the parameters.

   The parameters are saved in the system.

```
                              ASMi-54
Main Menu > Configuration>

1. System                      >
2. Physical Layer              >
3. Applications                 >

C-Clear All Statistics
ESC-Previous menu; !-Main menu; &-Exit; ?-Help
```

Figure 4-1. Configuration Screen

```
                              ASMi-54
Main Menu > Configuration > System

1. Management                        >
2. Terminal                          >
3. Fault Propagation                 >
4. Date and Time
5. Factory Defaults

ESC-Previous menu; !-Main menu; &-Exit
```

Figure 4-2. Configuration System Screen

```
                              ASMi-54
Main Menu > Configuration >System > Management

1. Device information                  >
2. Host                                >
3. Managers list                    [] >
4. Management Access                   >

ESC-Previous menu; !-Main menu; &-Exit
```

Figure 4-3. Management Screen

```
                                    ASMi-54
Main Menu > Configuration > System > Management > Device Information

   Description                 … (ASMi-54, HW Version 0.00, SW Version 1.00)

1. Name                        … (ASMi-54)
2. Location                    … (Location of the device)
3. Contact                     … (Name of the contact person)

S - Save
ESC-Previous menu; !-Main menu; &-Exit
```

Figure 4-4. Typical Device Information Screen

Configuring IP Host Parameters

You can manage the unit via a network management station connected to one of the unit's ports. To establish a proper connection, it is necessary to configure the Host IP parameters. In addition, by selecting a forwarding mode and VLAN parameters, it is possible to create a separate management VLAN.

➤ **To define the Host IP parameters:**

1. Select Main Menu›Configuration›System›**Management**.

   The Management screen appears (see *Figure 4-3*).

2. Select **Host IP**.

   The Host IP screen appears (see *Figure 4-5*).

3. In the **Host IP** screen:

   1. Select **IP Address** and enter the IP address of the IP host.
   2. Select **IP Mask** and enter the host IP subnet mask.
   3. Select **Default Gateway** and enter the default gateway IP address.
   4. Select **Read Community** and type the name of a community with read-only authorization.

      The default is Public.

   5. Select **Write Community** and type the name of a community with write authorization.
   6. Select **Trap Community** and type the name of a community to which the unit should send traps.
   7. Select **Encapsulation** to define VLAN tagging performed by the host.

      The Encapsulation screen appears (see *Figure 4-6*).

4. From the **Encapsulation** screen, select **Host Tagging** and toggle between **Untagged** and **Tagged**.

   - **Untagged** – The host sends and receives frames with no VLAN tag to/from the bridge.

- **Tagged** – The host receives frames only when they are tagged with the host's VLAN ID, and it sends frames to the bridge with this tag.

Note *When Host Tagging is set to **Tagged**, two parameters are added to the menu: **Host VLAN ID** and **VLAN Priority**.*

The default is **Untagged**.

5. Select **Host VLAN ID** to specify the host VLAN ID (1–4094).

   Enter the number of the VLAN ID.

6. Select **VLAN Priority** to specify the priority level for the host VLAN (0–7).
7. Press ‹**S**› to save the changes.
8. Return to the **Host IP** screen and press ‹**S**› to save the parameters.

   The changes are saved in the unit.

```
                              ASMi-54
Main Menu > Configuration > System > Management > Host IP

1. IP Address                        … (172.17.143.140)
2. Mask                              … (255.255.255.0)
3. Default gateway                   … (172.17.143.1)
4. Read community                    … (public)
5. Write community                   … ()
6. Trap community                    … ()
7. Encapsulation                     >

S - Save
ESC-Previous menu; !-Main menu; &-Exit
```

Figure 4-5. Host IP Screen

```
                              ASMi-54
Main Menu > Configuration > System > Management > Host IP >
Encapsulation
1

1. Host tagging                        > (Tagged)
2. Host VLAN ID [1-4094]               … (2)
3. Host Priority Tag [0-7]             … (0)

S - Save
ESC-Previous menu; !-Main menu; &-Exit
```

Figure 4-6. Encapsulation Screen

Configuring Terminal Parameters

The Terminal is connected to the Control Port. The management software allows you to configure the terminal baud rate.

Note *The Baud Rate parameter is masked during a Telnet session.*

➤ **To change the terminal baud rate:**

1. Select Main Menu›Configuration›**System**.

   The Configuration System screen appears (see *Figure 4-2*).

2. Select **Terminal**.

   The Terminal screen appears (see *Figure 4-7*).

3. Select **Baud Rate.**

   The Baud Rate screen appears (see *Figure 4-8*).

4. Select the desired baud rate (9600, 19200, 115200).

   The default baud rate is **9600**.

5. Return to the **Terminal** screen and press ‹**S**› to save the changes.

   The changes are saved in the unit.

```
                              ASMi-54
Main Menu > Configuration > System > Terminal

1. Baud rate                    > (9600 bps)

S - Save
ESC-Previous menu; !-Main menu; &-Exit
```

Figure 4-7. Terminal Screen

```
                              ASMi-54
Main Menu>Configuration>System>Terminal>Baud rate (19200 bps)

1. 9600 bps
2. 19200 bps
3. 115200 bps

ESC-Previous menu; !-Main menu; &-Exit
```

Figure 4-8. Baud Rate Screen

Setting Management Access

➤ **To modify Telnet, SNMP, or WEB access permissions for a user:**

1. Select Main Menu›Configuration›System›**Management**.

   The Management screen appears (see *Figure 4-3*).

2. Select **Management Access**.

   The Management Access screen appears (see *Figure 4-9*).

3. Select the access level you wish to change: **Telnet Access**, **SNMP Access**, or **WEB Access**.

4. Select the permission setting for this access level: **Enable**, **Disable** or **Manage Only**.

   The default is **Enable**.

5. Press ‹**S**› to save the changes.

   The changes are saved in the unit.

```
                              ASMi-54
Main Menu > Configuration > System > Management > Management
Access

1. User Access
2. Telnet Access                          (Enable)
3. SNMP Access                            (Enable)
4. WEB Access                             (Enable)

ESC-Previous menu; !-Main menu; &-Exit
```

Figure 4-9. Management Access Screen

Configuring the Network Managers

The network management stations to which the SNMP agent sends traps can be defined or modified. Up to ten managers can be defined. Entering the IP address and corresponding subnet mask defines each management station. In addition, you can temporarily prevent a manager station from receiving traps by masking the network manager.

➤ **To edit the manager list:**

1. Select Main Menu›Configuration›System›**Management**.

   The Management screen appears (see *Figure 4-3*).

2. Select **Managers List**.

   The Management List screen appears (see *Figure 4-10*).

3. To add a new network manager, press ‹**A**› (Add).

4. Move the cursor to the **Manager IP** cell you wish to modify by pressing the **Tab** key. The selected cell is highlighted and the value appears in the **Change cell** field.

5. Select **Change Cell**, and press ‹**Enter**› to enter a new IP address for the selected network manager.
6. Move the cursor to the **Trap** field and toggle between **Mask** and **Unmask** to mask or unmask traps for the selected management station.

   The default is **Unmask**.
7. Press ‹**S**› to save the changes.

```
                              ASMi-54
Main Menu > Configuration > System > Management > Managers List

                   IP address           Trap
  1.                1.1.1.1             Unmask
| 2.                2.2.2.2             Unmask
v 3.                3.3.3.3             Mask
  4.                4.4.4.4             Unmask
  5.                5.5.5.5             Unmask

1. Change cell                       … (1.1.1.1)

ESC-Previous menu; !-Main menu; &-Exit; ?-Help
```

Figure 4-10. Manager List Screen

```
                              ASMi-54
Main Menu > Configuration > System > Management > Managers List

Manager IP Mask          ... (255.255.255.0)
Manager Trap Mask        ... (Enable)
Save All
 >

ESC-prev menu; !-main menu; &-exit;                    1 user(s)
```

Figure 4-11. Manager List Screen, Add Mode

4.2 Configuring for Operation

This section explains how to operate the unit.

Setting Device-Level Parameters

This section includes procedures for setting the configuring fault propagation options.

Configuring Fault Propagation

When the Network › User Fault Propagation feature is enabled, the LAN ports are deactivated when the PCS uplink goes down. They will come up again once the PCS port is resynchronized.

➤ **To configure the fault propagation:**

1. Select Main Menu›Configuration›**System**.

   The Configuration System screen appears (see *Figure 4-2*).

2. Select **Fault Propagation**.

   The Fault Propagation screen appears (see *Figure 4-12*).

3. Select Network›**User Fault Propagation** and toggle between **Enable** and **Disable**.

4. Press ‹**S**› to save the changes.

```
                              ASMi-54
Main Menu > Configuration > System > Fault Propagation

1. Network - >  User Fault Propagation      (Disable)

S - Save
ESC-Previous menu; !-Main menu; &-Exit
```

Figure 4-12. Fault Propagation Screen

Configuring Date and Time

The Date and Time screen is used to configure the NTP client parameters.

The NTP client is used as a means to receive the date and time from the network. When the NTP server is properly configured and accessible, the device displays the real date and time as was received from the NTP server, instead of the system uptime, which is the default state.

➤ **To configure the NTP client parameters:**

1. Select Main Menu›Configuration›**System**.

   The Configuration System screen appears (see *Figure 4-2*).

2. Select **Date and Time**.

   The Date and Time screen appears (see *Figure 4-13*). The parameters are described in *Table 4-1*.

3. Press ‹**S**› to save the changes.

```
                          ASMi-54
Main Menu > Configuration > System > Date and Time

    Date                                ...(01-10-1949)
    Time                                ...(00:00:01)
1   NTP Mode                            >  (Unicast Client)
2   GMT                                 >  (0)
3   NTP Server IP Address               ...(172.17.163.93)
4   NTP Update Interval (sec)           ...(5)
5   Send Initiated NTP Request

ESC-Previous menu; !-Main menu; &-Exit
```

Figure 4-13. Date and Time Screen

Table 4-1. Date and Time Configuration Parameters

Parameter	Possible Values	Remarks
NTP Mode	Unicast Client Disable	NTP request is sent to a specific IP address **Default: Disable**
GMT	-12 ... 12	Offset from Greenwich Mean Time **Default: 0**
NTP Server IP Address	xxx.xxx.xxx.xxx	**Default: 0.0.0.0**
NTP Update Interval (sec)	0 (disable) 1 ... 4294967295	Time (in seconds) between NTP requests **Default: 0 (disable)**
Send Initiated NTP Request		Each time this is pressed, an NTP request is sent regardless of the NTP update interval.

Configuring Physical-Level Port Parameters

ASMi-54 has one or four Fast Ethernet interfaces and up to four SHDSL interface. The Fast Ethernet and SHDSL configuration menus are accessed from the **Physical Layer** menu.

Configuring the Fast Ethernet Port

The following parameters can be configured for the Ethernet ports at the physical level:

- Administrative Status
- Autonegotiation
- Flow Control
- Maximum advertised capability for autonegotiation procedure
- Data rate and duplex mode (only when autonegotiation is disabled)
- MDIX Auto Cross Over.

➤ **To configure the Fast Ethernet port:**

1. Select Main Menu›**Configuration.**

   The Configuration screen appears (see *Figure 4-1*).

2. Select **Physical Layer**.

   The Physical Layer screen appears (see *Figure 4-14*).

3. Select **Fast Ethernet**.

   The Fast Ethernet Port Configuration screen appears (see *Figure 4-15*). The parameters are described in *Table 4-2*.

4. Press ‹**S**› to save the changes.

```
                              ASMi-54
Main Menu > Configuration > Physical Layer

1. Ethernet          >
2. SHDSL                  >

>
ESC-Previous menu; !-Main menu; &-Exit
```

Figure 4-14. Physical Layer Screen

```
                              ASMi-54
Main Menu > Configuration > Physical Layer > Ethernet

   Port                           (1)
1. Administrative Status          (Up)
2. Auto Negotiation               (Enable)
3. Flow Control                   (Disable)
4. Max Capability Advertised      (100base – TX Full Duplex)
5. MDIX Auto Cross Over           (Enable)

F-Forwards; B-Backwards; S-Save
ESC-Previous menu; !-Main menu; &-Exit
```

Figure 4-15. Fast Ethernet Port Configuration Screen

Table 4-2. Fast Ethernet Port Configuration Parameters

Parameter	Possible Values	Remarks
Port	1 or 4	The Fast Ethernet port number. **Default: 1**
Administrative Status	Up Down	The Fast Ethernet activation. **Default: Up**
Auto Negotiation	Enable Disable	Enables autonegotiation signaling over the Ethernet. **Default: Enable**
Flow Control	Enable Disable	Used to configure the default administrative PAUSE mode for this interface. **Default: Disable**
Max Capability Advertised	10baseT Half Duplex 10baseT Full Duplex 100baseTX Half Duplex 100base TX Full Duplex	Specifies the set of capabilities advertised by the local autonegotiation entity. **Default: 100BaseTX full-duplex** *Note: Appears only when autonegotiation is enabled.*
Speed & Duplex	10baseT Half Duplex 10baseT Full Duplex 100baseTX Half Duplex 100base TX Full Duplex	The static speed and duplex that the port will use. **Default: 100BaseTX full-duplex** *Note: Appears only when autonegotiation is disabled.*
MDIX Auto Cross Over	Enable Disable	Enables and disables Auto Cross Over functionality. **Default: Enable**

Configuring the SHDSL Ports

This section includes procedures for configuring the SHDSL PCS ports, configuring the SHDSL PME ports, and setting the clock source.

Configuring the SHDSL PCS Ports

➤ **To configure SHDSL PCS ports:**

1. Select **Main Menu > Configuration > Physical Layer.**

   The Physical Layer screen appears (see *Figure 4-14*).

2. Select **SHDSL**.

   The SHDSL PCS Port Configuration screen appears (see *Figure 4-16*). The parameters are described in *Table 4-3*.

```
                              ASMi-54
Main Menu > Configuration > Physical Layer > SHDSL

PCS (Physical Coding Sublayer)   (1)
Administrative Status            (Up)
Power Backoff                    (Disable)

1. Clock Source                  (RX Clock: STU-R)
2. PME Configuration              >



>
F-Forward
ESC-Previous menu; !-Main menu; &-Exit
```

Figure 4-16. SHDSL PCS Port Configuration Screen

Table 4-3. SHDSL PCS Port Configuration Parameters

Parameter	Possible Values	Remarks
PCS (Physical Coding Sublayer)	1	Index of the SHDSL PCS. **Default: 1**
Administrative Status	Up Down	Administrative status of the SHDSL PCS. **Default: Up**
Power Backoff	Disable	The power backoff mode. **Default: Disable** *Note: This parameter is Read Only and cannot be configured.*
Clock Source	Internal: STU-C RX Clock: STU-R	The source clock determines SHDSL mode (STU-C or STU-R). If source clock is receive (RX), source port is the first connected SHDSL line. **Default: RX Clock: STU-R**

Parameter	Possible Values	Remarks
Transmission Mode	Annex A/F Annex B/G	The regional setting of the SHDSL span. **Default: Annex B/G** *Note: This parameter can be configured in STU-C mode only.*
PME Configuration		The configuration of the PME (Physical Medium Entity), see *Configuring the SHDSL PME Ports*.

Configuring the Clock Source

Transmitted data can be clocked either from an internal clock within the ASMi-54, or from an external clock via the SHDSL links.

➤ **To configure the clock source:**

1. Select Main Menu›Configuration›Physical Layer›**SHDSL**.

   The SHDSL PCS Port Configuration screen appears (see *Figure 4-16*).

2. Select **Clock Source** and toggle between **Internal** and **RX Clock**.
   - **Internal: STU-C** – To set the internal clock as the clock source.
   - **RX Clock: STU-R** – To set an external clock (from SHDSL link) to clock the clock source.
3. Press ‹**S**› to save the changes.

Configuring the SHDSL PME Ports

➤ **To configure the SHDSL PME ports:**

1. Select Main Menu›Configuration›Physical Layer›**SHDSL**.

   The SHDSL PCS Port Configuration screen appears (see *Figure 4-16*).

2. Select **PME Configuration**.

   The SHDSL PME Port Configuration screen appears (see *Figure 4-17*). The parameters are described in *Table 4-4*.

3. Press ‹**F**› to change the number of the PME (Physical Medium Entity).
4. Press ‹**S**› to save the changes.

```
                                ASMi-54
Main Menu > Configuration > Physical Layer > SHDSL > PME
Configuration

PME (Physical Medium Entity)                (1)

1. Administrative Status                    (Up)
2. Line Probe                               (Disable)
3. Line Rate                                (192000)
4. Current Margin                         > (0)
5. Worst Margin                           > (0)
6. Loop Attenuation Threshold (dB)[0…127] (0)
7. SNR Margin Threshold (dB)[0…15]        (0)

>
F-Forward
ESC-Previous menu; !-Main menu; &-Exit
```

Figure 4-17. SHDSL PME Port Configuration Screen

Table 4-4. SHDSL PME Port Configuration Parameters

Parameter	Possible Values	Remarks
PME (Physical Medium Entity)	1 – 4	Index of the SHDSL PME. **Default: 1**
Administrative Status	Up Down	Administrative status of the SHDSL PME. **Default: Up**
Line Probe	Disable Enable	Enable/disable support for Line Probe of the units in an SHDSL span. **Default: Disable**
Line Rate	192000-5696000 bps	The transmission rate for the associated SHDSL PME in bits-per-second (bps) and includes both payload (user data) and any applicable framing overhead. **Default:** 192000
Current Margin	-10...0...21	The downstream/upstream current condition target SNR margin in dB. To configure the current margin, see *Configuring the SHDSL PME Current Margin*. **Default: 0 (Disable)** *Note: Appears only when Line Probe is "Enable".*
Worst Margin	-10...0...21	The downstream/upstream worst case target SNR margin in dB. To configure the worst margin, see *Configuring the SHDSL PME Worst Margin*. **Default: 0 (Disable)** *Note: Appears only when Line Probe is "Enable".*
Loop Attenuation Threshold (dB)	0...127	The loop attenuation alarm threshold. **Default: 0**

Parameter	Possible Values	Remarks
SNR Margin Threshold (dB)	0...15	The SNR margin alarm threshold. **Default: 0**

Configuring the SHDSL PME Current Margin

Note *Only available in STU-R mode.*

➤ **To configure the SHDSL PME current margin:**

1. Select Main Menu›Configuration›Physical Layer›SHDSL›**PME Configuration**.

   The SHDSL PME Port Configuration screen appears (see *Figure 4-17*).

2. Select **Current Margin**.

   The SHDSL PME Current Margin screen appears (see *Figure 4-18*).

3. Select an item (1-32).
4. Press ‹**S**› to save the changes.

Configuring the SHDSL PME Worst Margin

Note *Only available in STU-R mode.*

➤ **To configure the SHDSL PME worst margin:**

1. Select Main Menu›Configuration›Physical Layer›SHDSL›**PME Configuration**.

   The SHDSL PME Port Configuration screen appears (see *Figure 4-17*).

2. Select **Worst Margin**.

   The SHDSL PME Worst Margin screen appears (see *Figure 4-18*).

3. Select an item (1-32).
4. Press ‹**S**› to save the changes.

```
                                ASMi-54
Main Menu > Configuration > Physical Layer > SHDSL > PME
Configuration > Current Margin

1. –10 dB                       17. 6 dB
2. –9 dB                        18. 7 dB
3. –8 dB                        19. 8 dB
4. –7 dB                        20. 9 dB
5. –6 dB                        21. 10 dB
6. –5 dB                        22. 11 dB
7. –4 dB                        23. 12 dB
8. –3 dB                        24. 13 dB
9. –2 dB                        25. 14 dB
10. –1 dB                       26. 15 dB
11. 0 dB (Disable)              27. 16 dB
12. 1 dB                        28. 17 dB
13. 2 dB                        29. 18 dB
14. 3 dB                        30. 19 dB
15. 4 dB                        31. 20 dB
16. 5 dB                        32. 21 dB

>

ESC-Previous menu; !-Main menu; &-Exit
```

Figure 4-18. SHDSL PME Current Margin Screen

Note *The SHDSL PME Worst Margin screen is the same as the SHDSL PME Current Margin screen except for the heading.*

Configuring the Internal Bridge

The internal bridge connects the unit's ports. Configure the bridge for it to properly process the VLAN tags to maintain priority of the data flows.

The bridge operates in transparent mode (learning is disabled) or filtered mode (learning and filtering are enabled).

➤ **To configure the internal bridge:**

1. Select Main Menu›**Configuration**.

   The Configuration screen appears (see *Figure 4-1*).

2. Select **Applications**.

   The Applications screen appears (see *Figure 4-19*).

3. Select **Bridge**.

   The Bridge screen appears (see *Figure 4-20*). The parameters are described in *Table 4-5*.

4. For Static MAC Table configuration, see *Using the Static MAC Table.*

5. For Bridge Port configuration, see *Configuring the Bridge Ports.*

6. For VLAN Membership configuration (in Aware bridge only), see *Configuring VLAN Membership*.
7. Press ‹S› to save the changes.

```
                              ASMi-54
Main Menu > Configuration > Applications

1. Bridge                    >
2. QoS                       >

ESC-Previous menu; !-Main menu; &-Exit
```

Figure 4-19. Applications Screen

```
                              ASMi-54
Main Menu > Configuration > Applications > Bridge

1.  VLAN Mode                            (Aware)
2.  Forwarding Mode                      (Filter)
3.  Aging time (sec) [300 – 4080]    … (300)
4.  Static MAC table                   []>
5.  Bridge port                          >
6.  VLAN membership                      >

S - Save
ESC-Previous menu; !-Main menu; &-Exit
```

Figure 4-20. Bridge Screen

Table 4-5. Bridge Parameters

Parameter	Possible Values	Remarks
VLAN Mode	Aware Unaware	Forwarding is based on MAC address only or on VLAN+MAC. • **Aware** – Bridge operates according to 802.1Q • **Unaware** – Operates according to 802.1D. **Default: Unaware**
Forwarding Mode	Filter Transparent	Determines whether the bridge learns MAC addresses. • **Filter** – Learning and filtering are enabled • **Transparent** – No learning is performed. Each packet received is forwarded to all other ports automatically, unless static MAC is used. **Default: Filter**
Aging Time (sec)	300...4080	Aging time for entries in the MAC table. If the aging time elapses, and no frame has been received from the MAC, it is erased from the MAC table. **Default: 300** seconds

Using the Static MAC Table

Static MAC addresses are stored in the MAC table.

➤ **To add a static MAC address:**

1. Select Main Menu›Configuration›Applications› **Bridge**.

   The Bridge screen appears (see *Figure 4-20*).

2. Select **Static MAC Table**.

   The **Static MAC Table** screen appears (see *Figure 4-21*), with VLAN ID entries for a VLAN-aware bridge only.

3. To add a static MAC address, press **A** (Add Entry).

   The Static MAC Table screen display changes, as shown in *Figure 4-22*.

4. In Add mode, perform the following:

   1. Select **MAC Address**, and enter a new MAC address.
   2. Select **VLAN ID**, and choose a VLAN ID for the MAC address, 1-4094.
   3. Select **Receive Bridge Port**, and choose the interface this MAC address should be attached to.
   4. Press ‹**S**› to save the MAC address.
   5. Press ‹**ESC**› to return to the **Static MAC Table** screen.

5. Return to the Static MAC Table screen and press ‹**S**› to save the table.

```
                              ASMi-54
Configuration > Applications > Bridge > Static MAC Table

      VLAN ID       MAC address            Receive Bridge port

  1     1           11-11-11-11-11-11            1
| 2     1           22-22-22-22-22-22            2
v 3     2           33-33-33-33-33-33            3
  4     3           44-44-44-44-44-44            3
  5     4           55-55-55-55-55-55            5

1. MAC address … (11-11-11-11-11-11)

C – Clears the table ; S – Save ; A – Add entry
ESC-Previous menu; !-Main menu; &-Exit; ?-Help
```

Figure 4-21. Static MAC Table Screen

```
                              ASMi-54
MAC table handling

1. MAC address                  … (00-00-00-00-00-00)
2. VLAN ID [1-4094]               (1)
3. Bridge port [1 – N]            (1)

S - Save
ESC-Previous menu; !-Main menu; &-Exit; ?-Help
```

Figure 4-22. Static MAC Table, Add Mode

➤ **To remove a static address from the table:**

1. Select Main Menu›Configuration›Applications› Bridge›**Static MAC Table**.

   The Static MAC Table screen appears (see *Figure 4-21*).

2. Select a MAC address that you want to remove and press ‹**R**›.

   The MAC address is deleted from the table.

➤ **To clear the MAC table:**

1. Select Main Menu›Configuration›Applications›Bridge›**Static MAC Table**.

   The Static MAC Table screen appears (see *Figure 4-21*).

2. Press ‹**C**› to clear the table.

   The following message appears:

   ```
   Are you sure (Y/N)?
   ```

3. Press ‹**Y**› to confirm deletion of all MAC addresses from the table.

Configuring the Bridge Ports

The unit is supplied with the Bridge Ports preconfigured for basic use. The factory-set configuration is shown in *Table 4-6*.

Note *To reconfigure the ports, first delete the configuration for each port.*

Table 4-6. Factory Set Bridge Port Settings

Bridge Port	Configured to
1	Reserved for management host
2	Fast Ethernet Port 1
3	Fast Ethernet Port 2
4	Fast Ethernet Port 3
5	Fast Ethernet Port 4
6	PCS Port 1

➤ **To delete a factory-set bridge port configuration:**

1. Select Main Menu›Configuration›Applications›**Bridge**.

   The Bridge screen appears (see *Figure 4-20*).

2. Select **Bridge Port**.

   The **Bridge Ports** screen appears (see *Figure 4-23*).

3. Type the Bridge Port number.

Note *Bridge Port 1 is reserved for management.*

4. Press ‹**F**› to toggle through the Bridge ports.
5. Press ‹**D**› to delete the configuration.
6. Press ‹**S**› to save the changes.

```
                              ASMi-54
Main Menu > Configuration > Applications > Bridge > Bridge Port

1. Bridge port [1 – 6]                          ...(2)
2. Bind                                            (Eth-1)
3. Activation                                      (Enable)
4. Ingress filtering                               (Disable)
5. Accept frame type                               (All)
6. Port VID / Stacking VID [1 – 4094]           ...(3)
7. Copy Origin Priority                            (Disable)
8. Default Priority Tag [0-7]                   ...(4)
9. Egress Tag Handling                             (None)
10. Ingress Tag Handling                           (None)

F-Forwards; B-Backwards; S - Save
ESC-Previous menu; !-Main menu; &-Exit; ?-Help
```

Figure 4-23. Bridge Ports Screen

Table 4-7. Bridge Port Parameters

Parameter	Possible Values	Remarks
Bridge Port Number	1 - 6	Bridge port number. **Default: 2** *Note: Bridge port number 1 is reserved for the host bridge port.*
Bind		The type of port to be bound. To configure a bridge port, see *Configuring a Bridge Port*.
Activation	Enable Disable	Specifies if this port is part of the bridge or not. Press the option number to toggle enable/disable. **Default: Enable**
Ingress Filtering	Enable Disable	When Enabled, the device discards incoming frames for VLANs which do not include this Port in its Member set. When Disabled, the port accepts all incoming frames. **Default: Disable** *Note: Appears only when in VLAN-Aware mode.*
Accept Frame Type	All Tag Only	**Tag Only** specifies that the device discards untagged frames. **All** specifies that untagged frames received on this port are accepted and assigned to the PVID for this port. **Default: All** *Note: Appears only when in VLAN-Aware mode.*
Port VID / Stacking VID	1–4094	This is the PVID, the VLAN ID assigned to untagged frames or priority-tagged frames received on this port. If Stacking is enabled, this is the tag to be added. **Default: 2**
Copy Original Priority	Enable Disable	Copy priority from original frame. **Default: Disable**
Default Priority Tag	0-7	Default VLAN frame priority. Applies to untagged frames. **Default: 0**
Egress Tag Handling	Stacking Stripping None	Stacking: Adds the PVID to every frame transmitted from the port. Stripping: Removes the first VLAN tag from every transmitted frame, on the egress of the port. **Default: None**
Ingress Tag Handling	Stacking Stripping None	Stacking: Adds the PVID to every frame received on the ingress of the port. Stripping: Removes the first VLAN tag from every received frame, on the ingress of the port. **Default: None**

Configuring a Bridge Port

➤ To configure a bridge port:

1. Select Main Menu›Configuration›Applications›Bridge›**Bridge Ports**.

   The **Bridge Ports** screen appears (see *Figure 4-23*).

2. Select **Bind** to define which port the bridge port should be bound to.

   The Bind screen appears (see *Figure 4-24*).

Note

- *The Bind option does not appear for Bridge port 1 (Management host). The host cannot be bound.*
- *Usually there is not need to bind BPs, as all are bound in the default configuration.*

```
                              ASMi-54
Configuration > Application > Bridge > Bridge ports > Bind

1. Fast Ethernet [number] / PCS [Number]      ...(1)

ESC-Previous menu; !-Main menu; &-Exit; ?-Help
```

Figure 4-24. Bridge Ports Bind Screen

3. Select **Fast Ethernet**, and type the number of the Fast Ethernet port / PCS to which you want to bind the bridge port.

Note *The Bridge may have a total of six Bridge Ports (BP). BP1 is dedicated to the IP Host. BP2-6 may be bound to Fast-Ethernet ports 1–4 or to the PCS port.*

4. Press ‹**S**› to save the changes.
5. Press ‹**ESC**› to return to the **Bridge Ports** menu.
6. In the **Bridge Ports** menu, configure the Bridge Ports parameters (see *Table 4-7*). The settings pertain to the port to which you bound the bridge port in the previous steps.
7. Press ‹**S**› to finish the bridge ports configuration.

Configuring VLAN Membership

➤ To configure VLAN Membership:

1. Select Main Menu›Configuration›Applications›**Bridge**.

   The Bridge screen appears (see *Figure 4-20*).

2. Select **VLAN Membership**.

   The VLAN Membership screen appears (see *Figure 4-25*).

3. Select **VLAN ID**, and type the VLAN ID you wish to configure.
4. Select **Egress Tagged Ports.** Define the set of ports to transmit packets for this VLAN as tagged.

5. Select **Egress Untagged Ports.** Define the set of ports to transmit packets for this VLAN as untagged.
6. Press <**A**> to add BP to this VLAN.
7. Press <**F**> to toggle through the VLAN IDs.
8. Press <**R**> to delete the configuration.
9. Press <**S**> to save the VLAN Membership configuration.

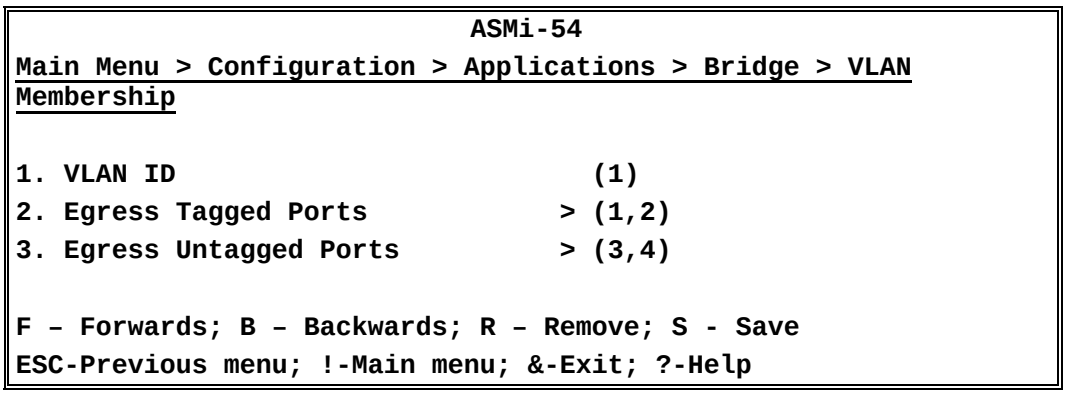
ASMi-54
Main Menu > Configuration > Applications > Bridge > VLAN Membership
1. VLAN ID (1)
2. Egress Tagged Ports > (1,2)
3. Egress Untagged Ports > (3,4)
F – Forwards; B – Backwards; R – Remove; S - Save
ESC-Previous menu; !-Main menu; &-Exit; ?-Help

Figure 4-25. VLAN Membership Screen

Configuring Quality of Service (QoS)

Three methods of traffic classification are supported:

- 802.1 priority mapping
- DSCP priority mapping, using tag values
- Priority mapping per bridge port.

The classification method is chosen using the Priority Classification menu.

Four traffic queues are supported, which can be assigned priorities using the **Priority Mapping** menu.

Class 0 (default) has the lowest priority and Class 2 has the highest priority. These queues are priority queues, that is, packets arriving with lower priority will only be transmitted after all packets with higher priority have been transmitted. It implies possible starvation of the lower priority traffic in case the higher priority traffic uses all of the available bandwidth.

Selecting a Traffic Classification Method

➤ **To select a traffic classification method:**

1. Select Main Menu›**Applications.**

   The Applications screen appears (see *Figure 4-19*).

2. Select **QoS**.

   The QoS screen appears (see *Figure 4-26*).

3. Select **Priority Classification**.

   The QoS Priority Classification screen appears (see *Figure 4-27*).

4. Select the desired traffic classification method:

- 802.1p
- DSCP
- Per Port.

5. Press ‹**S**› to save the changes.

```
                                ASMi-54
Main Menu > Configuration > Applications > QoS

1. Priority Classification                (802.1p)
2. Priority Mapping                        >

ESC-Previous menu; !-Main menu; &-Exit
```

Figure 4-26. QoS Screen

```
                                ASMi-54
Main Menu > Configuration > Applications > QoS > Priority
Classification
1. 802.1p
2. DSCP
3. Per Port

ESC-Previous menu; !-Main menu; &-Exit;
```

Figure 4-27. QoS Priority Classification Screen

Assigning Priorities to Traffic Queues for 802.1p

➤ To assign priorities to traffic queues for 802.1p:

1. Select Main Menu›Configuration›Applications›QoS›**Priority Classification**.

   The QoS Priority Classification screen appears (see *Figure 4-27*).

2. Select **802.1p** as the desired traffic classification method.
3. Select Main Menu›Applications›**QoS**.

   The QoS screen appears (see *Figure 4-26*).

4. Select **Priority Mapping**.

   The Priority Mapping (802.1p) screen appears (see *Figure 4-28*).

5. Select the desired priority (0–7) and enter the assigned traffic queue number (0–2). Each traffic queue can be assigned to more than one priority.
6. Repeat the above step for all priorities.
7. Select **Save** to save the changes.

```
                                ASMi-54
Main Menu > Configuration > Applications > QoS > Priority
Mapping (802.1p)

1. User Priority 0 > (Traffic Class 0)
2. User Priority 1 > (Traffic Class 0)
3. User Priority 2 > (Traffic Class 1)
4. User Priority 3 > (Traffic Class 1)
5. User Priority 4 > (Traffic Class 2)
6. User Priority 5 > (Traffic Class 2)
7. User Priority 6 > (Traffic Class 2)
8. User Priority 7 > (Traffic Class 2)

ESC-Previous menu; !-Main menu; &-Exit
```

Figure 4-28. Priority Mapping Screen (802.1p)

Assigning Priorities to Traffic Queues for DSCP

➤ To assign priorities to traffic queues for DSCP:

1. Select Main Menu›Configuration›Applications›QoS›**Priority Classification**.

   The QoS Priority Classification screen appears (see *Figure 4-27*).

2. Select **DSCP** as the desired traffic classification method.
3. Select Main Menu›Applications›**QoS.**

   The QoS screen appears (see *Figure 4-26*).

4. Select **Priority Mapping**.

   The Priority Mapping (DSCP) screen appears (see *Figure 4-29*). The menu lists only those values that have been changed from their default values.

5. Select the desired tag value (0–63) and enter the assigned traffic queue number (0–3). Each traffic queue can be assigned to more than one tag. To add a new entry, select **a** (add) and enter the tag value and traffic queue number.
6. Repeat the above step for all tag values you wish to change.
7. Press ‹**A**› (Add) to add tag values.
8. Press ‹**R**› (Remove) to remove tag values.
9. Press ‹**C**› (Copy) to copy tag values.
10. Press ‹**S**› to save the changes.

```
                                ASMi-54
Main Menu > Configuration > Applications > QoS > Priority
Mapping (DSCP)

1. Tag Value 0 > (Traffic Class 0)
2. Tag Value 1 > (Traffic Class 0)
3. Tag Value 2 > (Traffic Class 0)
4. Tag Value 3 > (Traffic Class 0)
.
.
64. Tag Value 63 > (Traffic Class 0)

A – add; R – Remove ; C - copy
ESC-Previous menu; !-Main menu; &-Exit
```

Figure 4-29. Priority Mapping Screen (DSCP)

Assigning Priorities to Traffic Queues Per Bridge Port

➤ To assign priorities to traffic queues per bridge port:

1. Select Main Menu›Configuration›Applications›QoS›**Priority Classification**.

   The QoS Priority Classification screen appears (see *Figure 4-27*).

2. Select **Per Port** as the desired traffic classification method.
3. Select Main Menu›Applications›**QoS.**

   The QoS screen appears (see *Figure 4-26*).

4. Select **Priority Mapping**.

   The Priority Mapping (Per Port) screen appears (see *Figure 4-30*).

5. Select the desired bridge port.
6. Select **Traffic Class** and enter the traffic queue number (0–3) to be assigned to the bridge port. Each traffic queue can be assigned to more than one port.
7. Repeat the above step for all active bridge ports.
8. Press ‹**S**› to save the changes.

```
                                ASMi-54
Main Menu > Configuration > Applications > QoS > Priority
Mapping (Per Port)

Bridge Port 1            > (1)
1. Traffic Class         > (Traffic Class 0)

F – Forwards; B – Backwards; C - copy
ESC-Previous menu; !-Main menu; &-Exit
```

Figure 4-30. Priority Mapping Screen (Per Port)

4.3 Additional Tasks

Procedures for miscellaneous tasks are provided in this section.

- Displaying the Inventory
- Changing User Name and Password
- Transferring Software and Configuration Files
- Resetting ASMi-54.

Displaying the Inventory

The inventory displays a description of the unit, including its hardware revision and power supply type.

Note *The inventory is a wide table with 132 characters. It is best viewed by setting your terminal to 132 character wide display.*

➤ To display the inventory:

- Select Main Menu›Inventory.

  The Inventory table appears (see *Figure 4-31*). Use the arrow keys to navigate throughout the table.

```
                                ASMi-54
Main Menu > Inventory

  ID      Description        Vendor type  Class     Entity name       HWRev
  1001    ASMi-54 Device          Chassis             ASMi-54         1.00
  4001    Power Supply              Power Supply      PS
| 7001    Fast Eth Port 1           Port              FAST 1
v 7002    Fast Eth Port 2           Port              FAST 2
  7003    Fast Eth Port 3           Port              FAST 3
  7004    Fast Eth Port 4           Port              FAST 4
  7005    SHDSL Port 1              Port              SHDSL 1
  7006    SHDSL Port 2              Port              SHDSL 2
  7007    SHDSL Port 3              Port              SHDSL 3
  7008    SHDSL Port 4              Port              SHDSL 4
      - >  >


 >
```

Figure 4-31. Typical Inventory Screen

Changing User Name and Password

From the **User Level** menu you can change the current user name and password. ASMi-54 supports two user names and passwords. *Table 4-8* lists the default user settings supplied with the unit.

Table 4-8. Default User Settings

User	User Name	Password
1	su	1234
2	user	1234

➤ **To change the current user name and password:**

1. Select Main Menu›Configuration›System›Management›**Management Access**.

   The Management Access screen appears (see *Figure 4-9*).

2. Select **User Access**.

   The User Access screen appears (see *Figure 4-32*).

3. Select **User Level**.

   The User Level screen appears (see *Figure 4-33*).

4. Select **User Name**, and enter a new user name.

   The user name can be up to eight characters.

5. Select **Old Password**, and enter the current password.

   The default is 1234.

6. Select **New password** and assign a new password of up to eight characters to the new or existing user name.

Note *The password is case sensitive.*

7. Select **Confirm New Password** to confirm the new password.

   If the new password is incorrect, an **Illegal confirm password** error message appears. Reassign the new password.

8. Press ‹**S**› to save the changes.

   The new password is saved.

```
                                ASMi-54
Main Menu > Configuration > System > Management > Management Access > User
Access

1. Change password              >


ESC-Previous menu; !-Main menu; &-Exit
```

Figure 4-32. User Access Screen

```
                                    ASMi-54
Main Menu > Configuration > System > Management > Management Access > User
Access > User Level

1. User name                    … (USER)
2. Old Password                 … (********)
3. New password                 … (********)
4. Confirm new password         … (********)


S - Save
ESC-Previous menu; !-Main menu; &-Exit
```

Figure 4-33. Change Password Screen

Transferring Software and Configuration Files

This section provides procedures for:

- Installing new software releases on the ASMi-54 unit
- Transferring configuration files.

Two software versions are stored, each of them in one of the two partitions of the flash memory, which also contains a boot program. The software is stored in a compressed format. The active version is decompressed and loaded into the unit's RAM upon power-up. The passive software is kept for backup purposes. If the active software becomes corrupted, you can swap it with the backup. By default, the unit is delivered with active software only.

New software releases are distributed as ***.img** files, which can be downloaded to the ASMi-54. When starting a download, the current backup is erased and the new software placed in the backup partition. When downloading is complete, the unit checks the integrity of the new software file. If it is correct, the backup and active files are swapped. The new software release becomes active and the former active software becomes the backup. If a failure occurs while downloading, the new version is erased. In this case, only one version is left stored in the flash memory.

Configuration files can be uploaded for storage and backup.

➤ **To transfer files via TFTP:**

1. Select Main Menu›**Utilities**.

   The Utilities screen appears (see *Figure 4-34*).

2. Select **File Transfer**.

   The File Transfer screen appears (see *Figure 4-35*).

3. Select **TFTP**.

   The TFTP screen appears (see *Figure 4-36*).

4. Select **Server IP Address,** and enter the IP address of the TFTP server.
5. Select **Remote File Name**, and enter a file name.

6. Select **File Type**, and choose whether you intend to transfer a software program (IMG) or configuration file.
7. Select **Save** to save the changes.
8. Select **Command** to start the desired procedure:
   - **Upload**: To save a software or configuration file on a remote server
   - **Download**: To transfer a software or configuration file to the unit.

   ASMi-54 starts file transfer.

The TFTP file transfer process is logged with the following system messages, which are stored in the log file (see *Chapter 6*):

- TFTP – Starting Upload
- TFTP – Starting Download
- TFTP – Upload Failed
- TFTP – Download Failed.

```
                              ASMi-54
Main Menu > Utilities

1. TFTP                          >
2. Reset Device
3. Reset PCS

ESC-Previous menu; !-Main menu; &-Exit; ?-Help
```

Figure 4-34. Utilities Screen

```
                              ASMi-54
Main Menu > Utilities > File Transfer

1. TFTP                          >

ESC-Previous menu; !-Main menu; &-Exit; ?-Help
```

Figure 4-35. File Transfer Screen

```
                              ASMi-54
Main Menu > Utilities > File Transfer > TFTP

   Status                             (No operation)
   Error                              (No error)

1. Server IP Address                  (0.0.0.0)
2. Remote File name                   ()
3. File Type                          (Configuration)
4. Command                          >

ESC-Previous menu; !-Main menu; &-Exit; ?-Help
```

Figure 4-36. TFTP Screen

Resetting ASMi-54

This section describes two types of reset functions:

- Resetting configuration parameters to default settings
- Overall reset of the device
- Reset the PCS.

Resetting to the Default Settings

You can reset the unit to its default settings.

➤ **To reset to the default settings:**

1. Select Main Menu›Configuration›**System**.

   The Configuration System screen appears (see *Figure 4-2*).

2. Select **Factory Defaults**.

   The following message appears:

```
The device will restart with default configuration, proceed?
                          (Y/N)
```

3. Press ‹**Y**› to confirm the reset.

   All parameters are reset to their default settings, and the unit is reset.

Resetting the Unit

You can perform an overall reset of the unit.

➤ **To reset ASMi-54:**

1. Select Main Menu›**Utilities**.

   The Utilities screen appears (see *Figure 4-34*).

2. Select **Reset Device**.

   The following confirmation message appears:

```
The device will restart. Do you want to proceed? (Y/N).
```

3. Press ‹**Y**› to confirm the reset.

   The device resets itself.

Resetting the PCS

You can perform a reset of the PCS.

➤ **To reset the PCS:**

1. Select Main Menu›**Utilities**.

   The Utilities screen appears (see *Figure 4-34*).

2. Select **Reset PCS**.

   The following confirmation message appears:

```
The PCS will restart. Do you want to proceed? (Y/N).
```

3. Press ‹**Y**› to confirm the reset.

The PCS resets.

Chapter 5

Configuring Typical Applications

This chapter gives detailed instructions for configuring for a typical application in which a unit is used for Customer Premises with inband management and an Aware Bridge.

5.1 Configuring the ASMi-54 Application

Figure 5-1 illustrates a typical application that includes Ethernet services, point-to-point.

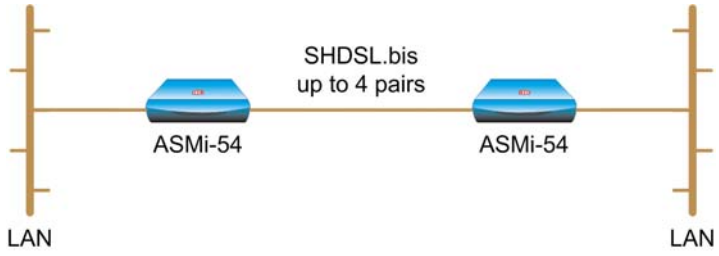

Figure 5-1. Typical Application

The following network requirements exist:

- Up to 4 SHDSLs and 2 VLANs
- 1 Fast Ethernet
- 1 Network Manager
- Bridge (Aware)

5.2 Configuring the Management Parameters

This part of the application configuration procedure has three major stages:

- Defining the host
- Defining the default gateway
- Defining managers.

Defining the Host

Defines the host parameters such as IP address and subnet mask, and the read/write communities.

➤ **To define the host:**

1. From the Management menu (Main›Configuration›System›**Management**), select **Host IP**.

   The Host IP menu appears.

2. From the Host IP menu, configure the following:
   - ASMi-54 IP address – 172.17.143.140
   - Host IP mask – 255.255.255.0
   - Host default gateway IP address – 172.17.143.1
   - Read Community – Public
   - Write Community – Private
   - Trap Community – Public.
3. Press ‹**ESC**› to return to the Management menu.
4. Press ‹**S**› to save the changes.

Defining the Default Gateway

➤ **To define the default gateway:**

1. From the Management menu (Main›Configuration›System›**Management**), select **Host IP**.

   The Host IP menu appears.

2. In the Host IP menu, select **Default Gateway**.
3. Enter 172.17.143.1, or specify an IP address of 0.0.0.0 to disable the default gateway.

Defining Managers

In this step you define the managers and specify which manager(s) will receive SNMP traps.

Up to ten managers can be defined. Entering the IP address and corresponding subnet mask defines each management station. In addition, you can temporarily prevent a manager station from receiving traps, by masking the network manager.

➤ **To define new managers:**

1. From the Management menu (Main›Configuration›System›**Management**), select **Manager List** to open the Manager List menu.
2. Enter **A** (Add) to add a new network manager.
3. Specify an IP address for the new manager.

4. In the Trap field, specify **Mask** or **Unmask** to mask or unmask traps for the new management station.
5. Select **Save**.
6. Repeat the previous steps for each network manager you wish to add.

➤ **To update existing manager parameters:**

1. From the Management menu (Main›Configuration›System›**Management**), select **Manager List** to open the Manager List menu.
2. Move the cursor to the Manager IP cell you wish to modify by pressing ‹**Tab**›. The selected cell is highlighted and the value is displayed in the "Change cell" field.
3. Press ‹**1**›, and then press ‹**Enter**› to enter a new IP address for the selected network manager.
4. Move the cursor to the **Trap** field and toggle between **Mask** and **Unmask** to mask or unmask traps for the selected management station.
5. Repeat the previous steps for each manager you wish to update.
6. Press ‹**ESC**› to return to the Management menu.

5.3 Configuring SHDSL Physical Layer

Defines the characteristics of the physical SHDSL ports.

➤ **To configure the SHDSL physical layer:**

1. Open the SHDSL Physical Layer menu (Main›Configuration›Physical layer›**SHDSL**).

   The system automatically opens the appropriate menu.
2. Leave the parameters at their default settings in one device and change the clock source of the other device to **RX Clock: STU-R**.
3. To define the parameters for each SHDSL physical port, see *Configuring Ports at the Physical Level* for more information.
4. Press ‹**ESC**› to return to the Physical Layer menu.
5. Press ‹**ESC**› to return to the Configuration menu.

5.4 Configuring the Bridge

This part of the application configuration procedure has four major stages:

- Defining the bridge.
- Defining VLANS and adding them the relevant bridge ports.
- Configuring the SHDSL physical layer.

Defining the Bridge

Defines the Bridge entity.

➤ **To define the bridge:**

1. Open the Bridge menu (Main›Configuration›Application›**Bridge**).
2. Define the bridge parameters. See *Configuring the Internal Bridge* for more information on each of the parameters.

Defining VLANs

Define the required VLAN and add to it the relevant bridge ports.

➤ **To define a VLAN:**

1. In the Bridge menu, select **VLAN members** to open the VLAN membership configuration menu.
2. Leave the parameters at their default settings (**VLAN-Unaware**).
   To define and create a new VLAN, see *Configuring the Internal Bridge* for more information.
3. Add the relevant ports to the defined VLAN (including the Host bridge port if it is the VLAN used for management).

Defining Bridge Ports

The unit is supplied with the Bridge Ports preconfigured for basic use and do not need to be reconfigured. The factory set configuration is shown in *Table 5-1*. To reconfigure the ports, the configuration for each port must first be deleted. See *Chapter 4, Configuring the Bridge Ports* for more details.

Table 5-1. Factory Set Bridge Port Settings

Bridge Port	Configured to
1	Reserved for management host; appears after providing the host with the IP address.
2	Fast Ethernet Port 1
3	Fast Ethernet Port 2
4	Fast Ethernet Port 3
5	Fast Ethernet Port 4
6	PCS Port 1

Chapter 6

Diagnostics and Troubleshooting

This section describes how to:

- Monitor the system performance
- Display status and statistics
- Display system messages
- Detect errors
- Troubleshoot the device
- Perform connectivity tests.

6.1 Monitoring Performance

The software provides access to the following status information:

- System level – MAC address, connection status, and Event Log file
- Physical level – Ethernet and SHDSL port status
- Application level – MAC table.

The status information is available via the Monitoring menu.

Displaying System Status Information

The System menu shows the interface connection status and Event Log file. For a description of system messages, which are displayed via the Event Log file, refer to *Displaying the Event Log File*.

➤ **To display interface connection information:**

1. Select Main Menu >**Monitoring**.

   The Monitoring screen appears (see *Figure 6-1*).

2. Select **System**.

   The Monitoring System screen appears (see *Figure 6-2*).

3. Select **Interface Status**.

   The Interface Status screen appears (see *Figure 6-3*). The parameters are described in *Table 6-1*.

```
                                    ASMi-54
Main Menu > Monitoring

1. System                    >
2. Physical Ports            >
3. Application               >

C-Clear All Statistics
ESC-Previous menu; !-Main menu; &-Exit; ?-Help
```

Figure 6-1. Monitoring Screen

```
                                    ASMi-54
Main Menu > Monitoring > System

MAC address                  … (00-D2-20-10-20-30)
System Up Time                 (44:20:12)

1. Interface Status            [] >
2. Event log                   [] >

ESC-Previous menu; !-Main menu; &-Exit; ?-Help
```

Figure 6-2. Monitoring System Screen

```
                                    ASMi-54
Main Menu > Monitoring > System > Interface Status
 Description        Type               Activation        Operation
 Fast Ethernet 1    Fast Eth           Enable             Down
 PME Port 1         Multirate HDSL2    Enable             Up

ESC-Previous menu; !-Main menu; &-Exit; ?-Help
```

Figure 6-3. Interface Status Screen

Table 6-1. Interface Status Parameters

Parameter	Description
Interface Description	Fast Ethernet and PME Port
Type	The type of the interface
Activation	Whether the interface is enabled (Up) or disabled (Down), as user defined via the Ethernet and SHDSL menus (see *Chapter 4*).
Operation	Actual operational status of the link (Up or Down).

Displaying the Physical Port Status

You can view the status of the unit's physical ports.

For a description of the Ethernet and SHDSL port statistics, refer to *Displaying Interface Statistics*.

Displaying the Ethernet Port Status

➤ To display the Ethernet port status:

1. Select Main Menu›Monitoring›**Physical Ports**.

   The Monitoring Physical Ports screen appears (see *Figure 6-4*).

2. Select **Ethernet**.

   The Monitoring Physical Ports - Ethernet screen appears (see *Figure 6-5*).

3. Select **Status**.

   The Fast Ethernet Status screen appears (see *Figure 6-6*). The parameters are described in *Table 6-2*.

4. Press ‹F› to select the Port number.

```
                              ASMi-54
Main Menu > Monitoring > Physical Ports

1. Ethernet   >
2. SHDSL                                  >

ESC-Previous menu; !-Main Menu; &-Exit
```

Figure 6-4. Monitoring Physical Ports Screen

```
                              ASMi-54
Main Menu > Monitoring > Physical Ports > Ethernet

1. Status                     >
2. Statistics                 >

C-Clear All Ethernet Ports Statistics
ESC-Previous menu; !-Main menu; &-Exit; ?-Help
```

Figure 6-5. Monitoring Physical Ports - Ethernet Screen

```
                              ASMi-54
Main Menu > Monitoring > Physical Ports > Ethernet > Status

Port                          (1)

Administrative Status         (Enable)
Operation Status              (Up)
Speed & Duplex                (100Mbps – Full Duplex)
Flow Control                  (Enable)

F - Forwards; B - Backwards
ESC-Previous menu; !-Main menu; &-Exit; ?-Help
```

Figure 6-6. Ethernet Status Screen

Table 6-2. Ethernet Status Parameters

Parameter	Description
Port	The port slot number to be handled.
Admistrative Status	Whether the interface is enabled or disabled.
Operation Status	The actual operational status of the link (Up or Down).
Speed & Duplex	The current data rate and duplex mode of the link (100 – full, 100 –half, 10 – full, or 10 - half).
Flow Control	Whether flow control is enabled or disabled.

Displaying the SHDSL PCS Port Status

➤ To display the SHDSL PCS port status:

1. Select Main Menu›Monitoring›**Physical Ports.**

   The Monitoring Physical Ports screen appears (see *Figure 6-4*).

2. Select **SHDSL**.

   The Monitoring Physical Ports - SHDSL screen appears (see *Figure 6-7*).

3. Select **Status**.

   The SHDSL PCS Status screen appears (see *Figure 6-8*). The parameters are described in *Table 6-3* .

4. Press ‹**F**› to select the PCS number.

```
                              ASMi-54
Main Menu > Monitoring > Physical Ports > SHDSL

1. Status                                  >
2. Statistics                              >

ESC-Previous menu; !-Main Menu; &-Exit
```

Figure 6-7. Monitoring Physical Ports - SHDSL Screen

```
                              ASMi-54
Main Menu > Monitoring > Physical Ports > SHDSL > Status

PCS (Physical Coding Sublayer) (1)

Administrative Status          (Up)
Operation Status               (Up)
SHDSL Mode                     (STU-R)
PSD Mask                       (Symmetric)
SHDSL Transmission Mode        (Annex_B/G)
SHDSL Port Wiring              (2 Wire)
1.PME Status                      >


F-Forwards ; B-backwards

ESC-Previous menu; !-Main Menu; &-Exit
```

Figure 6-8. SHDSL PCS Status Screen

Table 6-3. SHDSL PCS Status Parameters

Parameter	Description
PCS (Physical Coding Sublayer)	The SHDSL PCS number to be handled.
Admistrative Status	Whether the interface is up or down.
Operation Status	The actual operational status of the SHDSL PCS (Up or Down).
SHDSL Mode	The SHDSL mode (Central or Remote).
PSD Mask	The PSD (Power Spectral Density) Mask for the associated SHDSL line (Symmetric or Asymmetric).
SHDSL Mode Transmission Mode	The current PSD (Power Spectral Density) regional setting of the SHDSL span (Annex A/F or Annex B/G).
SHDSL Port Wiring	The SHDSL port wiring (2Wire(1), 4Wire(2), or 8Wire(4)).
PME Status	The status of the PME (Physical Medium Entity), see *Displaying the SHDSL PME Port Status*.

Displaying the SHDSL PME Port Status

➤ To display the SHDSL PME port status:

1. Select Main Menu›Monitoring›Physical Ports›SHDSL›**Status.**

   The SHDSL PCS Status screen appears (see *Figure 6-8*).

2. Select **PME Status**.

   The SHDSL PMS Status screen appears (see *Figure 6-9*). The parameters are described in *Table 6-4* .

3. Press ‹**F**› to select the PME number.

4. Press ‹**F**› to select the PCS number.

```
                              ASMi-54
Main Menu > Monitoring > Physical Ports > SHDSL > Status > PME
Status

PME (Physical Medium Entity) Number     (1)
PCS (Physical Coding Sublayer) Number   (1)

Administrative Status                   (Up)
Operation Status                        (Up)
SHDSL PME State                         (Data)
SHDSL PME Rate                          (5696kbps)
Current Noise Margin                    (19dB)
Current Loop Attenuation                (0dB)

F-Forwards ; B-backwards
ESC-Previous menu; !-Main Menu; &-Exit
```

Figure 6-9. SHDSL PME Status Screen

Table 6-4. SHDSL PME Status Parameters

Parameter	Description
PME (Physical Medium Entity) Number	The SHDSL PME number to be handled.
PCS (Physical Coding Sublayer) Number	The SHDSL PCS number to which the PME line belongs.
Administrative Status	Whether the interface is enabled (up) or disabled (down).
Operation Status	The actual operational status of the SHDSL PCS (Up or Down).
SHDSL PME State	The current operational state (PreActivation, Activation, or Data).
SHDSL PME Rate	The actual PME rate (192...5696).
Current Noise Margin	The current SNR margin for this endpoint (0...30).
Current Loop Attenuation	The current loop attenuation for this endpoint (0...127).

Displaying Application-Level Status

At the application level, the unit provides information of the MAC addresses (static and learned) and their bridge port assignments; as well as VLAN IDs and their bridge port assignments.

➤ **To display the MAC table:**

1. Select Main Menu›Monitoring›**Application.**

   The Monitoring Application screen appears (see *Figure 6-10*).

2. Select **Bridge**.

   The Monitoring Application - Bridge screen appears (see *Figure 6-11*).

3. Select **View MAC Table**.

   The MAC Table screen appears (*Figure 6-12* and *Figure 6-13*). The parameters are described in *Table 6-5* .

```
                              ASMi-54
Main Menu > Monitoring > Application

1. Bridge>

ESC-Previous menu; !-Main menu; &-Exit; ?-Help
```

Figure 6-10. Monitoring Application Screen

```
                              ASMi-54
Main Menu > Monitoring > Application > Bridge

1. View MAC Table              [] >

ESC-Previous menu; !-Main menu; &-Exit; ?-Help
```

Figure 6-11. Monitoring Application - Bridge Screen

```
                              ASMi-54
Main Menu > Monitoring > Application > Bridge > View MAC Table

      VLAN ID   MAC address          Bridge port       Status

  1      1      11-11-11-11-11-11         1            Static
| 2      1      22-22-22-22-22-22         2            Dynamic
v 3      2      33-33-33-33-33-33         3            Static
  4      3      44-44-44-44-44-44         3            Dynamic
  5      4      55-55-55-55-55-55         5            Dynamic

ESC-Previous menu; !-Main menu; &-Exit; ?-Help
```

Figure 6-12. View MAC Table (VLAN Aware)

```
                              ASMi-54
Main Menu > Monitoring > Application > Bridge > View MAC Table

      MAC address           Bridge port            Status

  1   11-11-11-11-11-11          1                 Static
| 2   22-22-22-22-22-22          2                 Dynamic
V 3   33-33-33-33-33-33          3                 Static
  4   44-44-44-44-44-44          3                 Dynamic
  5   55-55-55-55-55-55          5                 Dynamic

ESC-Previous menu; !-Main menu; &-Exit; ?-Help
```

Figure 6-13. View MAC Table (VLAN Unaware)

Table 6-5. View MAC Table Parameters

Parameter	Description
VLAN ID (VLAN aware mode only)	The VLAN ID corresponding to the MAC address (1 – 4094).
MAC Address	The destination MAC address in a frame to which this entry's filtering information applies.
Bridge Port	The port number of the port from which a frame must be received in order for this entry's filtering information to apply.
Status	The status of the entry (Static or Dynamic).

6.2 Displaying Interface Statistics

You can display statistical data for the Ethernet and SHDSL ports.

Displaying Ethernet Port Statistics

You can display statistical data for the Ethernet ports.

➤ **To view Ethernet statistics:**

1. Select Main Menu›Monitoring›**Physical Ports**.

   The Monitoring Physical Ports screen appears (see *Figure 6-4*).

2. Select **Fast Ethernet**.

   The Monitoring Physical Ports - Ethernet screen appears (see *Figure 6-5*).

3. Select **Statistics**.

   The Fast Ethernet Statistics screen appears (see *Figure 6-14*). The parameters are described in *Table 6-6*.

4. Press <**F**> to select the Port number.

```
                              ASMi-54
Main Menu > Monitoring > Physical Ports> Ethernet > Statistics

    Port                            (1)
    Rx Correct Frames               (166185)
    Rx Correct Octets               10635840)
    Rx Alignment Error              (0)
    Rx FCS Errors                   (0)
    Rx Congestion Dropped Frames    (0)
    Tx Correct Frames               (13793)
    Tx Correct Octets               (882752)
    Tx Single Collision             (0)
    Tx Collision                    (0)
    Tx Multiple Collision           (0)
    Tx Deferred Transmissions       (0)
    Tx Late Collisions              (0)
    Tx Congestion Dropped Frames    (0)

F-Forward; B-Backwards; C-Clear statistics
ESC-Previous menu; !-Main menu; &-Exit; ?-Help
```

Figure 6-14. Fast Ethernet Statistics Screen

Table 6-6. Fast Ethernet Statistics Parameters

Parameter	Description
Port	The selected port slot number.
Rx Correct Frames	The number of correct frames received.
Rx Correct Octets	The number of octets (bytes) received
Rx Alignment Error	The number of frames received with a valid length, but with invalid FCS and a non-integral number of octets.
Rx FCS Errors	The number of frames with FCS errors received by this port.
Rx Congestion Dropped Frames	The number of frames that are discarded due to a lack of buffer space.
Tx Correct Frames	The number of frames successfully transmitted.
Tx Correct Octets	The number of octets (bytes) successfully tranmsmitted.
Tx Single Collision	The number of transmission attempts that experienced a single collision.
Tx Collision	The number of transmission attempts that experienced a collision.
Tx Multiple Collision	The number of transmission attempts that experienced multiple collisions

Parameter	Description
Tx Deferred Transmissions	The number of transmission attempts deferred in order to avoid a collision.
Tx Late Collisions	The number of transmission attempts that experienced late collisions.
Tx Congestion Dropped Frames	The number of frames discarded due to a lack of buffer space.

Clearing Ethernet Port Statistics

➤ **To clear all Ethernet and SHDSL statistics:**

- In the Monitoring screen (see *Figure 6-1*), press <**C**> to clear all Ethernet and SHDSL statistics.

➤ **To clear all Ethernet statistics:**

- In the Monitoring Physical Ports - Ethernet screen (see *Figure 6-5*), press <**C**> to clear all Ethernet statistics.

➤ **To clear port statistics:**

- In the Fast Ethernet Statistics screen (see *Figure 6-14*), press <**C**> to clear the selected Ethernet port statistics.

Displaying SHDSL Port Statistics

You can display statistical data for the SHDSL ports.

Displaying SHDSL PCS Port Statistics

➤ **To view SHDSL PCS port statistics:**

1. Select Main Menu›Monitoring›**Physical Ports**.

   The Monitoring Physical Ports screen appears (see *Figure 6-4*).

2. Select **SHDSL**.

   The Monitoring Physical Ports - SHDSL screen appears (see *Figure 6-7*).

3. Select **Statistics**.

   The SHDSL PCS Statistics screen appears (see *Figure 6-15*). The statistics are described in *Table 6-7*.

4. Press <**F**> to select the PCS number.

```
                              ASMi-54
Main Menu > Monitoring > Physical Ports > SHDSL > Statistics

PCS Number                (1)

RX Total Frames           (0)
RX Total Errors           (0)
TX Total Frames           (0)

1. PME Statistics           >
2. Clear All SHDSL Statistics

F-Forwards ; B-backwards; C – Clear PCS Statistics
ESC-Previous menu; !-Main Menu; &-Exit
```

Figure 6-15. SHDSL PCS Statistics Screen

Table 6-7. SHDSL PCS Statistics Parameters

Parameter	Description
PCS Number	The selected SHDSL PCS number.
RX Total Frames	The total number of frames received.
RX Total Errors	The total number of errors received.
TX Total Frames	The total number of frames transmitted.
PME Statistics	Statistics for the PME (Physical Medium Entity), see *Displaying SHDSL PME Port Statistics*.
Clear All SHDSL Statistics	Clear all SHDSL statistics.

Displaying SHDSL PME Port Statistics

SHDSL PME statistics can be displayed for the following intervals: current intervals, 15-minute intervals, current day intervals, day intervals, and accumulated data.

➤ **To view SHDSL PME port statistics:**

1. Select Main Menu›Monitoring›Physical Ports›SHDSL›**Statistics.**

   The SHDSL PCS Statistics screen appears (see *Figure 6-15*).

2. Select **PME Statistics**.

   The SHDSL PME Statistics screen appears (see *Figure 6-16*). The statistics are described in *Table 6-8*.

3. Press ‹**F**› to select the PME number.

4. Press ‹**F**› to select the PCS number.

```
                                ASMi-54
Main Menu > Monitoring > Physical Ports > SHDSL > Statistics >
PME Statistics

PME (Physical Medium Entity) Number      (1)
PCS (Physical Coding Sublayer) Number    (1)

1. Current Interval
2. 15 Min. Intervals
3. Current Day Interval
4. Day Intervals
5. Accumulated Data

F-Forwards ; B-backwards; C-Clear PME statistics
ESC-Previous menu; !-Main Menu; &-Exit
```

Figure 6-16. SHDSL PME Statistics Screen

Table 6-8. SHDSL PME Statistics Parameters

Parameter	Description
PME (Physical Medium Entity) Number	The selected SHDSL PME number.
PCS (Physical Coding Sublayer) Number	The SHDSL PCS number to which the PME line belongs.
Current Interval	The statistics counters in current 15 minutes intervals.
15 Min. Intervals	The statistics counters in intervals of 15 minutes. (Interval number 0 represents the current counters.)
Current Day Interval	The statistics counters in current 1 day intervals.
Day Intervals	The statistics counters in intervals of 1 day. (Interval number 0 represents the current counters.)
Accumulated Data	Accumulated statistics counters.

Displaying SHDSL PME Current Interval Statistics

➤ To view SHDSL PME Current Interval statistics:

1. Select Main Menu›Monitoring›Physical Ports›SHDSL›Statistics›**PME Statistics**.

   The SHDSL PME Statistics screen appears (see *Figure 6-16*).

2. Select **Current Interval**.

   The SHDSL PME Current Interval Statistics screen appears (see *Figure 6-17*). The statistics are described in *Table 6-9*.

3. Press <**F**> to select the PME number.

4. Press <**F**> to select the PCS number.

```
                              ASMi-54
Main Menu > Monitoring > Physical Ports > SHDSL > Statistics >
PME Statistics > Current Interval

PME (Physical Medium Entity) Number      (1)
PCS (Physical Coding Sublayer) Number    (1)

ES                           (0)
UAS                          (0)
SES                          (0)
LOSWS                        (0)
CRC Anomalies                (0)
Elapsed Time                 (150)

F-Forwards ; B-backwards
ESC-Previous menu; !-Main Menu; &-Exit
```

Figure 6-17. SHDSL PME Current Interval Statistics Screen

Table 6-9. SHDSL PME Current Interval Statistics

Parameter	Description
PME (Physical Medium Entity) Number	The selected SHDSL PME number.
PCS (Physical Coding Sublayer) Number	The SHDSL PCS number to which the PME line belongs.
ES	The number ofof Errored Seconds (ES) in the current 15-minute interval.
UAS	The number of Unavailable Seconds (UAS) in the current 15-minute interval.
SES	The number of Severely Errored Seconds (SES) in the current 15-minute interval.
LOSWS	The number of Count of Loss of Sync Word (LOSW) Seconds in the current 15-minute interval.
CRC Anomalies	The number of CRC anomalies in the current 15-minute interval.
Elapsed Time	The total elapsed seconds in the current 15-minute interval.

Displaying SHDSL PME 15 Minute Intervals Statistics

➤ **To view SHDSL PME 15 minute intervals statistics:**

1. Select Main Menu›Monitoring›Physical Ports›SHDSL›Statistics ›**PME Statistics.**

   The SHDSL PME Statistics screen appears (see *Figure 6-16*).

2. Select **15 Min. Intervals**.

   The SHDSL PME 15 Minute Intervals Statistics screen appears (see *Figure 6-18*). The statistics are described in *Table 6-10*.

3. Press ‹**F**› to select the PME number.
4. Press ‹**F**› to select the PCS number.
5. Press ‹**^F**› to select the Interval number.

```
                                    ASMi-54
Main Menu > Monitoring > Physical Ports > SHDSL > Statistics > PME Statistics
> 15 Min Intervals

PME (Physical Medium Entity) Number      (1)
PCS (Physical Coding Sublayer) Number    (1)
Interval Number [1-96]

ES                          (0)
UAS                         (0)
SES                         (0)
LOSWS                       (0)
CRC Anomalies               (0)

F-Forwards ; B-Backwards ; ^F-Forwards(Intervals) ; ^B-Backwards(Intervals)
ESC-Previous menu; !-Main Menu; &-Exit
```

Figure 6-18. SHDSL PME 15 Minute Intervals Statistics Screen

Table 6-10. SHDSL PME 15 Minute Intervals Statistics

Parameter	Description
PME (Physical Medium Entity) Number	The selected SHDSL PME number.
PCS (Physical Coding Sublayer) Number	The SHDSL PCS number to which the PME line belongs.
Interval Number	The Performance Data Interval number.
ES	The number of Errored Seconds (ES) during the interval.
UAS	The number of unavailable Seconds (UAS) during the interval.
SES	The number of Severely Errored Seconds (ES) during the interval.

Parameter	Description
LOSWS	The number of Loss of Sync Word (LOSW) Seconds during the interval.
CRC Anomalies	The number of CRC anomalies during the interval.

➤ **Displaying SHDSL PME Current Interval StatisticsTo view SHDSL PME Current Interval statistics:**

1. Select Main Menu›Monitoring›Physical Ports›SHDSL›Statistics›**PME Statistics**.

   The SHDSL PME Statistics screen appears (see *Figure 6-16*).

2. Select **Current Day Interval**.

   The SHDSL PME Current Day Interval Statistics screen appears (see *Figure 6-19*). The statistics are described in *Table 6-11*.

3. Press ‹**F**› to select the PME number.

4. Press ‹**F**› to select the PCS number.

```
                              ASMi-54
Main Menu > Monitoring > Physical Ports > SHDSL > Statistics >
PME Statistics > Current Day Interval

PME (Physical Medium Entity) Number      (1)
PCS (Physical Coding Sublayer) Number    (1)

ES                              (0)
UAS                             (0)
SES                             (0)
LOSWS                           (0)
CRC Anomalies                   (0)
Elapsed Time                    (900)

F-Forwards ; B-Backwards
ESC-Previous menu; !-Main Menu; &-Exit
```

Figure 6-19. SHDSL PME Current Day Interval Statistics Screen

Table 6-11. SHDSL PME Current Day Interval Statistics

Parameter	Description
PME (Physical Medium Entity) Number	The selected SHDSL PME number.
PCS (Physical Coding Sublayer) Number	The SHDSL PCS number to which the PME line belongs.
ES	The number of Errored Seconds (ES) during the current day.
UAS	The number of unavailable Seconds (UAS) during the current day.

Parameter	Description
SES	The number of Severely Errored Seconds (ES) during the current day.
LOSWS	The number of Loss of Sync Word (LOSW) Seconds during the current day.
CRC Anomalies	The number of CRC anomalies during the current day.
Elapsed Time	The number of seconds that have elapsed since the beginning of the current 1-day interval.

Displaying SHDSL PME Day Intervals Statistics

➤ To view SHDSL PME Day Intervals statistics:

1. Select Main Menu›Monitoring›Physical Ports›SHDSL›Statistics›**PME Statistics**.

   The SHDSL PME Statistics screen appears (see *Figure 6-16*).

2. Select **Day Intervals**.

   The SHDSL PME Day Intervals Statistics screen appears (see *Figure 6-20*). The statistics are described in *Table 6-12*.

3. Press <**F**> to select the PME number.
4. Press <**F**> to select the PCS number.
5. Press <**^F**> to select the Interval number.

```
                                    ASMi-54
Main Menu > Monitoring > Physical Ports > SHDSL > Statistics > PME Statistics
> Day Intervals

PME (Physical Medium Entity) Number      (1)
PCS (Physical Coding Sublayer) Number    (1)
Interval Number [1-7]

ES                          (0)
UAS                         (0)
SES                         (0)
LOSWS                       (0)
CRC Anomalies               (0)

F-Forwards ; B-Backwards ; ^F-Forwards(Intervals) ; ^B-Backwards(Intervals)
ESC-Previous menu; !-Main Menu; &-Exit
```

Figure 6-20. SHDSL PME Day Intervals Statistics Screen

Table 6-12. SHDSL PME Day Intervals Statistics

Parameter	Description
PME (Physical Medium Entity) Number	The selected SHDSL PME number.
PCS (Physical Coding Sublayer) Number	The SHDSL PCS number to which the PME line belongs.
Interval Number	The History Data Interval number.
ES	The number of Errored Seconds (ES) during the 1-day interval.
UAS	The number of unavailable Seconds (UAS) during the 1-day interval.
SES	The number of Severely Errored Seconds (ES) during the 1-day interval.
LOSWS	The number of Loss of Sync Word (LOSW) Seconds during the 1-day interval.
CRC Anomalies	The number of CRC anomalies during the 1-day interval.

Displaying SHDSL PME Accumulated Data Statistics

➤ To view SHDSL PME Accumulated Data statistics:

1. Select Main Menu›Monitoring›Physical Ports›SHDSL ›Statistics›**PME Statistics**.

   The SHDSL PME Statistics screen appears (see *Figure 6-16*).

2. Select **Accumulated Data**.

   The SHDSL PME Day Intervals Statistics screen appears (see *Figure 6-21*). The statistics are described in *Table 6-13*.

3. Press <**F**> to select the PME number.
4. Press <**F**> to select the PCS number.
5. Press <**^F**> to select the Interval number.

```
                              ASMi-54
Main Menu > Monitoring > Physical Ports > SHDSL > Statistics >
PME Statistics > Accumulated Data

ES                            (0)
UAS                           (0)
SES                           (0)
LOSWS                         (0)
CRC Anomalies                 (0)
Accumulated Time              (0)

ESC-Previous menu; !-Main Menu; &-Exit
```

Figure 6-21. SHDSL PME Accumulated Data Statistics Screen

Table 6-13. SHDSL PME Accumulated Data Statistics

Parameter	Description
ES	The number of Errored Seconds (ES) on this endpoint since it was last restarted.
UAS	The number of Unavailable Seconds (UAS) on this endpoint since it was last restarted.
SES	The number of Severely Errored Seconds (SES) on this endpoint since it was last restarted.
LOSWS	The number of Loss of Sync Word (LOSW) Seconds on this endpoint since it was last restarted
CRC Anomalies	The number of CRC anomalies on this endpoint since it was last restarted.
Accumulated Time	The time (in hundredths of a second) since the accumulated counters were last re-initialized.

Clearing the SHDSL Port Statistics

➤ **To clear all Ethernet and SHDSL statistics**

- In the Monitoring screen (see *Figure 6-1*), press <**C**> to clear all Ethernet and SHDSL statistics.

➤ **To clear all SHDSL PCS and PME statistics:**

- In the SHDSL PCS Statistics screen (see *Figure 6-15*), select **Clear All SHDSL Statistics** to clear all SHDSL PCS and PME statistics.

➤ **To clear SHDSL PCS statistics:**

- In the SHDSL PCS Statistics screen (see *Figure 6-15*), press <**C**> to clear the SHDSL PCS statistics.

➤ **To clear the SHDSL PME statistics:**

- In the SHDSL PME Statistics screen (see *Figure 6-16*), press <**C**> to clear the SHDSL PME statistics.

6.3 Handling Alarms and Traps

ASMi-54 maintains a log file, which can hold up to 1,000 system messages. All events are time-stamped.

Traps that are the result of events that were already reported by a different trap may not be repeated. For example, LOC traps will not be sent if the physical layer trap, such as LOS, was sent and the physical layer problem still exists.

The events are layered hierarchically, for example physical layer events/traps for Loop Attenuation and SNR Margin are threshold triggered, so that an event/trap is sent only if the threshold was exceeded.

Threshold can be configured for up to 8000 events per second.

The Event Log file contents can be viewed via an ASCII control terminal or a Network Management Station (NMS).

The contents can be cleared at any time.

Note *All traps (alarm and system) can be masked per manager. See Manager List in Chapter 4.*

Displaying the Event Log File

ASMi-54 has an integrated NTP client. The NTP client is used as a means to receive the date and time from the network. When the NTP server is properly configured and accessible, the device displays the real date and time as was received from the NTP server, instead of the system uptime, which is the default state.

When the real date and time are not available, the log file messages are recorded with the date 00-00-0000 and system uptime. Once the NTP server becomes available, all messages (including those already received) appear with the real date and time.

➤ **To access the Event Log file:**

1. Select Main Menu›Monitoring›**System.**

   The Monitoring screen appears (see *Figure 6-1*).

2. Select **System**.

   The Monitoring System screen appears (see *Figure 6-2*).

3. Select **Event Log**.

   The Event Log screen appears (see *Figure 6-22* and *Figure 6-23*). *Table 6-14* and *Table 6-15* present the event types that appear in the Event Log file.

4. Use the arrow keys to scroll the event list up and down, left and right.

```
                                ASMi-54
Main Menu > Monitoring > System > Event Log

    Source       Description   Information   Severity   Date        Time
1   PME Port 1   LINK_DOWN     PME port      Major      00-00-0000  00:00:01
2   PME Port 2   LINK_UP       PME port      Major      00-00-0000  00:00:02
3   Eth Port 4   LINK_DOWN     Eth port      Major      00-00-0000  00:00:04

C - Clear Table
ESC-Previous menu; !-Main menu; &-Exit;  ?-Help
```

Figure 6-22. Typical Log File Before NTP Server is Accessible

```
                                ASMi-54
Main Menu > Monitoring > System > Event Log

    Source       Description   Information   Severity   Date         Time
1   PME Port 1   LINK_DOWN     PME port      Major      04-07-1776   00:00:01
2   PME Port 2   LINK_UP       PME port      Major      02-06-1946   00:00:02
3   Eth Port 4   LINK_DOWN     Eth port      Major      01-10-1949   00:00:04

C - Clear Table
ESC-Previous menu; !-Main menu; &-Exit;  ?-Help
```

Figure 6-23. Typical Log File After NTP Server is Accessible

Table 6-14. Ethernet Event List

Event	Severity	Description
Link up	Major	Port is up.
Link down	Major	Port is down.
TFTP failure	Event	Failed in processing software download.
SNMP Authentication failure	Event	Wrong community.
TFTP start	Event	TFTP began.
TFTP finish	Event	TFTP ended.
Telnet Manager list restriction	Event	TELNET session from an unauthorized IP address.
WEB Manager list restriction	Event	WEB session from an unauthorized IP address.
SNMP Manager list restriction	Event	SNMP from an unauthorized IP address.

Table 6-15. Trap List

Trap	Description
Link Up	Signifies that the SNMP entity, acting in an agent role, has detected that the ifOperStatus object for one of its communication links left the down state and transitioned into some other state (but not into the notPresent state).
Link Down	Signifies that the SNMP entity, acting in an agent role, has detected that the ifOperStatus object for one of its communication links is about to enter the down state from some other state (but not from the notPresent state).
Cold Start	Signifies that the SNMPv2 entity, acting in an agent role, is reinitializing itself and that its configuration may have been altered.
Warm Start	Signifies that the SNMPv2 entity, acting in an agent role, is reinitializing itself such that its configuration is unaltered.
Authentication Failure	Signifies that the SNMPv2 entity, acting in an agent role, has received a protocol message that is not properly authenticated. While all implementations of the SNMPv2 must be capable of generating this

Trap	Description
	trap, the snmpEnableAuthenTraps object indicates whether this trap will be generated.
TFTP Status	This trap is sent whenever the status of TFTP changed.
Status Change	This trap is sent whenever the state of the entity the agent is responsible for changed.
SNR Margin Threshold Exceeded	Indicates that the SNR margin threshold (as per the hdsl2ShdslEndpointThreshSNRMargin value) has been reached/exceeded for the HDSL2/SHDSL segment endpoint.
Loop Attenuation Threshold Exceeded	indicates that the loop attenuation threshold (as per the hdsl2ShdslEndpointThreshLoopAttenuation value) has been reached/exceeded for the HDSL2/SHDSL segment endpoint.

Clearing the Event Log File

➤ **To clear the Event Log file:**

1. Select Main Menu›Monitoring›System›**Event Log.**

   The Event Log screen appears (see (see *Figure 6-22* and *Figure 6-23*).

2. Press ‹**C**› to clear the Event Log file.

   The following screen appears:

```
Are you sure you want to clear all alarms (Y/N)?
```

3. Press ‹**Y**› to clear or ‹**N**›to return to the Event Log screen.

Debugging Errors

You can debug errors when in Debug mode.

➤ **To debug errors:**

- Select Main Menu›**Debug**.

6.4 Troubleshooting

Use the chart shown in *Table 6-16* to identify and remedy problems in unit operation.

Table 6-16. Troubleshooting Chart

Fault	Probable Cause	Remedial Action
Power led off	No power supplied to unit	• Check power source. • Check power cable connected and correctly wired.
Ethernet Link Led off	• No Ethernet Link detected • Ethernet port in switch and ASMi-54 are not in the same rate or duplex mode	• Check cable connected and correctly wired. • Check switch and ASMi-54 Ethernet port configuration (negotiation, rate, duplex mode). • Use Event Log File to check events.
No traffic flow between two units	Configuration or logical layer problems	• Use System Interface Status screen for assistance. All active ports that show Activation–Up, should show Operation–Up. • Use Event Log File to check events. • Check ASMi-54 configuration and, if necessary, other ASMi-54 parameters.
Partial Traffic Flow	Timing configuration is not properly set	• Check timing settings.

6.5 Testing the Unit

ASMi-54 checks network integrity by running ping, trace route, or loopback tests.

Running a Ping Test

You can ping the remote IP host to check the IP connectivity.

➤ **To ping an IP host:**

1. Select Main Menu›**Diagnostics**.

   The Diagnostics menu appears (see *Figure 6-24*).

2. Select **Ping**.

   The Ping menu appears (see *Figure 6-25*).

3. Configure the following:

   1. **Destination IP Address:** IP address of the host that you intend to ping, 0.0.0.0 to 255.255.255.255.
   2. **Number of Frames to Send**: Select 0 to send a continuous stream of frames, or 1-50 to send a specified number of frames.
   3. **Frame Length**: Length of the frame (64-1500).

4. Select **Send Ping** to start sending pings.

   The results are shown in the lower scrolling message window.

5. Select **Stop Ping** to stop the ping test.

```
                              ASMi-54
Main Menu > Diagnostics

1. Ping                          >
2. Trace Route                   >

ESC-Previous menu; !-Main menu; &-Exit; ?-Help
```

Figure 6-24. Diagnostics Menu

```
                              ASMi-54
Main Menu > Diagnostics > Ping

1.  Destination IP Address                    0.0.0.0)
2.  Number of Frames to Send [0 – 50]        (0)
3.  Send Ping                                (Yes)
4.  Stop Ping                                ()

ESC-Previous menu; !-Main menu; &-Exit; ?-Help
```

Figure 6-25. Ping Menu

Tracing the Route

This diagnostic utility traces the route through the network from ASMi-54 to the destination host.

➤ **To trace a route:**

1. Select Main Menu›**Diagnostics**.

   The Diagnostics menu appears (see *Figure 6-24*).

2. Select **Trace Route**.

   The Trace Route menu appears (see *Figure 6-26*).

3. Select **Destination address** and enter the IP address of the host to which you intend to trace the route.

4. Select **Display Trace Route** to start tracing.

   ASMi-54 starts tracing the route, displaying the IP addresses of all hop nodes.

5. Select **Stop Trace Route** to stop the tracing.

```
                              ASMi-54
Main Menu > Diagnostics > Trace Route

1. Destination address       …(0.0.0.0)
2. Display Trace Route
3. Stop Trace Route

ESC-Previous menu; !-Main menu; &-Exit; ?-Help
```

Figure 6-26. Trace Route Menu

6.6 Technical Support

Technical support for this product can be obtained from the local distributor from whom it was purchased.

For further information, please contact the RAD distributor nearest you or one of RAD's offices worldwide. This information can be found at www.rad.com. (Offices – About RAD › Worldwide Offices; Distributors – Where to Buy › End Users)

Appendix A
Pinouts

A.1 Ethernet Connector

The 10/100BaseT Ethernet electrical interface is an 8-pin RJ-45 connector, wired in accordance with *Table A-1*.

Table A-1. 10/100BaseT Ethernet Connector Pinouts

Pin	Function
1	Tx+
2	Tx–
3	Rx+
4, 5	–
6	Rx–
7, 8	–

A.2 SHDSL Connector

The SHDSL electrical interface is an 8-pin RJ-45 connector, wired in accordance with *Table A-2*.

Table A-2. SHDSL Connector Pinouts

Pin	Function
1	NC
2	NC
3	Loop 2
4	Loop 1
5	Loop 1
6	Loop 2
7	NC
8	NC

Note *Do not connect wires to the NC pins.*

A.3 Control Connector

The control terminal interface terminates in a V.24/RS-232 9-pin D-type female DCE connector. *Table A-3* lists the control connector pin assignments.

Table A-3. CONTROL Connector Pinout

Pin	Function
2	Txd (TD)
3	Rxd (RD)
5	Ground (GND)

Appendix B

Boot Sequence and Downloading Software

This appendix provides a description of the ASMi-54 boot procedure via an ASCII terminal for downloading software.

The ASMi-54 software is stored in flash memory in two sections, in the boot sector and in the file system. The boot sector holds a boot program that calls up the rest of the program from the file system.

The file system can hold two compressed copies of the ASMi-54 code. One copy is called the operating file, and the other is called the backup file. The operating file is the default-executable ASMi-54 code. The backup file is used whenever the operating file is absent or corrupted.

B.1 Booting ASMi-54

ASMi-54 boots up automatically. After powering up, no user intervention is required, except when the user wants to access the file system to modify or update the software or the ASMi-54 configuration.

Accessing the Boot Manager

The Boot Manager menu is an option that allows the user to perform basic file transfer operations. These operations are all optional.

➤ To access the Boot Manager menu:

- Press <**Enter**> several times immediately after powering up ASMi-54.

  The Boot Manager menu is displayed (see *Figure B-1*).

```
ASMi-54 Boot Version 1.00 (Jan 20 2005)
Boot manager version 7.02 (Jan 20 2005)

0 - Exit Boot-Manager
1 - Dir
2 - Set Active Software Copy
3 - Delete Software Copy
4 - Download an Application by XMODEM
5 - Format flash
6 - Show basic hardware information
7 - Reset board
8 - System Configuration.
9 - Download an Application by TFTP
Press the ESC key to return to the Main Menu.
Select:
```

Figure B-1. Typical Boot Manager Menu

From the Boot Manager menu, you can:

- List all files stored in the flash memory
- Exchange the operating and backup files
- Delete the operating file; the backup file becomes the operating file
- Download a new operating file via XMODEM; the previous operating file is saved as the backup file
- Delete all software and configuration files
- Display the basic hardware information (RAM, ROM size etc)
- Reset the ASMi-54 board
- Configure the ASMi-54 IP address, IP mask and default gateway for the consecutive file download via TFTP.

If you choose to exchange or delete a file, you are prompted for confirmation.

B.2 Transferring the Software and Configuration Files

New software releases are distributed as separate files, which are downloaded to ASMi-54 using the XMODEM protocol or TFTP from the Boot Manager menu. Alternatively, you can download a new software release via TFTP, when the ASMi-54 management software is already running (**Main menu** > **Utilities** > **File Transfer**).

The TFTP protocol can also be used for uploading configuration files that contain the ASMi-54 database to the management station. When ASMi-54 is running, administrators can use this capability to distribute verified configuration files to all other units that use the similar configuration.

Downloading Application Files via XMODEM

Downloading application files using the XMODEM protocol is performed from the Boot Manager menu.

➤ **To download application file via XMODEM:**

1. Configure your ASCII terminal or terminal emulation utility running on your PC to the 115.2 kbps data rate.
2. Access the Boot Manager menu.

   The Boot Manager menu appears (see *Figure B-1*).
3. From the Boot Manager menu, select **Download Files or an Application by XMODEM**.

   ASMi-54 displays the following message:
   `Select Copy number for download (0)`
4. Select the backup partition by typing its number, **0** or **1**.

   ASMi-54 responds with the following string:
   `Please start the XMODEM download.`
5. Send the software release file to ASMi-54 using the XMODEM utility of you terminal application.

   Once the downloading is completed, ASMi-54 saves the new release as an active partition, the former active partition turns into backup, and the boot sequence continues normally.

   If a failure occurs during the download, the partially downloaded software is erased. In this case, only active software is left in the flash memory.

Downloading Application Files via TFTP

➤ **To download application file via TFTP:**

1. From the Boot Manager menu, select **System Configuration**.
2. Configure the IP parameters of ASMi-54 (IP address, IP mask and default gateway). These parameters are valid only for the TFTP file transfer via the Boot Manager.
3. Start a TFTP application.
4. Configure the TFTP communication parameters as follows:
   - Connection timeout – more than 30 seconds to prevent an automatic disconnection during the backup partition deletion (about 25 seconds).
   - Block size – 512 bytes.
   - UDP port – 69.
5. Select a local software release file to download.
6. Enter the TFTP server IP address.
7. Start downloading.

ASMi-54 automatically erases the backup partition (it takes about 25 seconds). Once the downloading is completed, ASMi-54 saves the new release as an active partition; the former active partition becomes a backup.

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Manual Name: ASMi-54 Ver. 1.0

Publication Number: 503-200-12/07

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Publication No. 503-200-12/07

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